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Railway Age

SECOND HALF OF 1924—No. 6 NEW YORK—AUGUST 9, 1924—CHICAGO

SIXTY-NINTH YEAR

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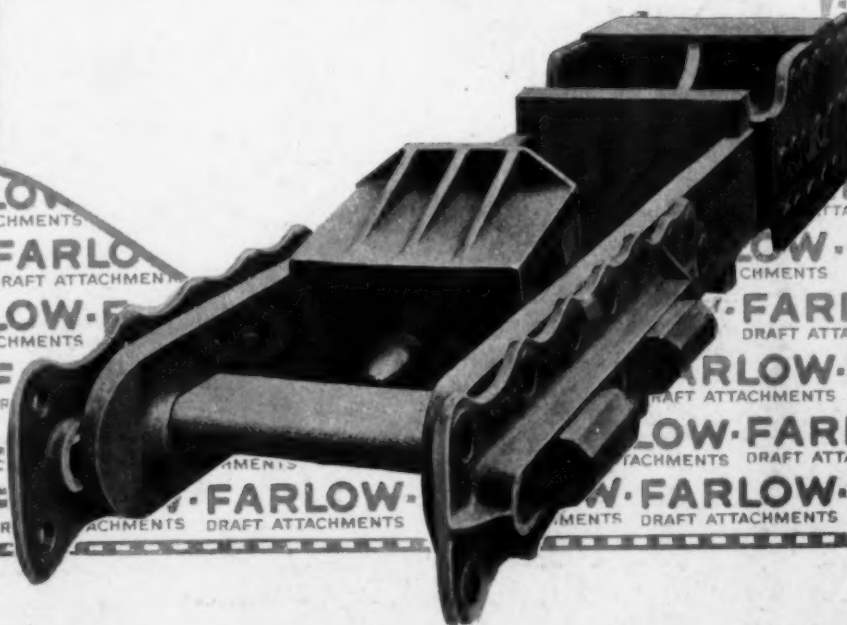
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UNION RAILWAY EQUIPMENT CO.
McCORMICK BLDG. CHICAGO

Volume 77

Number 6

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EDITORIAL

Railway Age

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Few railroad managements know whether the stationary power plants on the road are operated efficiently or not. If

Railroad Power Plants

asked for figures most of them could produce something, but investigation would show that these figures in a great many cases are based on approximations. In some instances locomotive coal is used by the power plant and power plant coal is used on locomotives. In others the plant has no record of the amount of water evaporated and such equipment as flow-meters, pyrometers, draft gages and CO₂ machines is looked upon as a lot of foolishness. There is such a thing as too much refinement, but the more common tendency in railroad practice is to look upon the power plant as a facility rather than as an operating problem for which the mechanical department is responsible. A boiler plant kept in operation with a load consisting of little more than a coffee urn in the railroad restaurant and enough steam to drive an idle electric generator is an example of instances that are rather common. The amount of electric power, steam and compressed air used in railroad terminals is increasing at such a rate that possible savings in power plant operation should not be overlooked. Where the conditions have been investigated it has frequently resulted in shutting down the plant and buying electric power during certain periods, in the building of a new plant, or in making radical changes in methods of operation. This issue contains a description of an efficiently operated railroad power plant which generates all of the power used at the terminal. A suggested method of contracting for electric power was described in the *Railway Age* of July 26 and a future issue will describe a power plant which generates steam for heating and for compressing air while electric power is bought. These descriptions show some of the things being done by railroads in the power plant field and may suggest means for improving conditions elsewhere. Each power plant presents special problems due to local conditions, but many of the ways of improving plants are applicable to all localities.

The constant succession of reports telling of persons killed or badly injured by being struck by trains at highway cross-

A Financial Aspect of the Crossing Danger

ings constitutes one of the features of life in this automobile age which engages the attention of all thoughtful railroad men, even though their own responsibility for finding a remedy may be slight or even non-existent. But if the killed and wounded in this perpetual battle were to be reduced, for a whole year, to zero, there would still be a serious question to face, that of damage to property and of potential bodily danger. The Baltimore & Ohio, reporting on its experience at the street crossings of its lines in the city of Baltimore for the first six months of 1924, states that "there was not a single casualty;" yet in the next sentence the statement speaks of "30 accidents" in the first six months. This must mean damage to gates, automobiles, locomotives or cars, where the human beings all escaped injury. The 30 cases include 24 where crossing gates which had been lowered before the arrival of trains were run into by motor vehicles and broken. "Some

of the accidents were due to bad brakes on the motor cars, others to speeding and trying to stop suddenly on slippery streets. In several cases drivers deliberately drove their cars into the gates because they did not want to stop. Two horse-drawn vehicles plunged into the crossing gates. One automobile ran into the side of a train moving over the crossing; and two motor trucks, stalled on the tracks, were struck by trains. Sixteen of the accidents occurred at night and fourteen in daylight." A number of railroads have entered suits in court against automobile owners who have thus damaged gates, locomotives or other railroad property. This kind of litigation is anything but pleasant, and in many cases the wisdom of beginning a suit may be doubtful, but this Baltimore record serves to remind us that the proposal to punish all offenders, which seems to be a favorite notion with many people who try to solve the multifarious problem of safety in the streets, involves a prodigious amount of work, expense and care by somebody.

In all the discussion that has taken place relative to the increase in the number of railway clerks there is one point

Efficiency of Clerical Labor

that has not yet received the attention it deserves. That point is the efficiency of the clerical labor. Readers of these columns are familiar enough with the complaint that the number of clerical employees has increased out of due proportion to other factors with which comparison might properly be made. It has been shown, of course, that there are many very good reasons why the number of railway clerks should have increased substantially in recent years. So much has been said about these reasons in these columns and elsewhere that it does not seem necessary to repeat them at this time. It was recently shown in a study prepared by the Bureau of Statistics of the Interstate Commerce Commission that the increase in the number of clerks had not been out of proportion to the increase in railroad freight ton-miles. This fact is of interest but it shows, nevertheless, a trend that is out of line with the situation as to the increase in the number of railway employees generally. In the case of most other classes of employees and of the number of railway employees in total, it has been the rule for the units of traffic handled per employee not to remain constant but rather to show a substantial increase as the years go by. The question of the increase in number of railway clerks is not one then that can be met by explanations alone. Of course, the problem of clerical efficiency is not one that a person can theorize about nor would it pay one to be unduly critical. Presumably two of the most important ways in which efficiency of the office forces would be developed would be through the use of labor saving machinery and by better system of organization—in other words, through the same general methods as rule in any other department. These methods have been given much study. There is a vast amount of labor saving machinery in use in the accounting department in particular and the companies prepared to furnish such machinery are many of them as large or as skilled as any in the railway supply field. Some roads have given some study to the problems of office

arrangement, of training clerical employees and of allocation of work. They may well go further with reference to all of these things. Much is said about the use of labor saving machinery and organization in the operating and maintenance departments. The problem of the use of clerical labor, in its broader aspects at least, is little different from that relating to the use of labor in the shop or roundhouse or in the roadway department.

At the International Advertising Convention at Wembley, England, advertising managers of two British railways gave addresses on their work. These speakers, while admitting that good service to the public was the best advertisement, nevertheless urged greater attention to general advertising, such as that employed by other industries, as the only method of safeguarding the interests of railway owners. This point of view has in recent years grown in favor with railway managements on this continent, so the suggestion of these British railway men in this regard is not particularly novel. Upon the form which this advertising should take, however, the speakers drew attention to the striking advantages of a medium, the development of which has hardly begun on this side of the Atlantic—to wit, the railway poster. The poster, if properly employed, carries an effective message to the patron of the railway and has the further advantage of cheapness, since the railways have available, without cost, the space for posting. As one of the speakers at Wembley pointed out, however, a successful poster campaign requires the direction of an expert. There must be frequent variation in design and styles. The posters must be placed in proper surroundings. They should be designed by competent artists. These points may seem obvious, but the fact is that at the present embryonic state of railway poster advertising in this country practically all of them are violated. One British road alone, the London & North Eastern, recently held an exhibition of 55 of its posters—all issued within the last year and many of them designed by artists famous throughout the country whose very names attracted attention to their work. Only from such a thorough campaign can the best results be expected and an examination of the methods which have been so successful in England may safely be recommended to any American railway which is seeking a wider distribution of its message and a more lasting impression of it on the minds of the public.

Posters for Railway Advertising

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On page 21 of the August issue of the Union Pacific Magazine, A. H. Feters, mechanical engineer, discusses the possibilities for improvement in locomotive design and some of his highly pertinent comments are worthy of repetition in these columns. They are summarized as follows: "The general practice of buying locomotives ready made should be abandoned. If a fair locomotive can be designed in four months and one good one in six months, a better one can be designed in a year or more, and the dividends on the extra time involved will be large. It is possible that lighter designs will be built in the future without in any way impairing the strength, by taking advantage of better materials and improved ideas. In the last few years the metallurgist has presented the locomotive designer with a valuable heritage in the use of highly improved steels, bearing alloys, etc. The modern trend toward longer locomotive runs calls for the use of the best materials that science can produce, coupled with a new effort by the designer to incorporate a real stamina,

Comments on Locomotive Design

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as the locomotive of tomorrow will be called upon to run a modern marathon in place of the 100-yard dash of our past experience in locomotive runs. The mere addition to a locomotive of a number of well recognized economical devices does not necessarily produce economy in ultimate operation. We should try to strike a balance, so far as possible, between fuel and operating economies and the extra maintenance and time out of service which the addition of a large number of these devices is liable to entail. A 25 per cent saving in fuel is only a saving during the time the locomotive is in actual operation. A carefully-proportioned, three-cylinder, simple locomotive with its uniform torque and increased starting effort is worthy of a great deal of study in connection with the problem of starting and handling our excessively heavy modern passenger trains." The possibilities of increasing efficiency and economy of operation by improving both locomotives themselves and the way in which they are utilized can hardly be overestimated.

A New Record in Train Loading

ONE OF THE MOST INTERESTING and significant figures that have appeared in railway statistics for a long time is one that is published in the Interstate Commerce Commission's operating statistics of Class I roads for May. This figure shows that in that month the average number of cars the railways moved in each freight train was 42.1. This is the largest average number of cars per freight train ever moved by them in any month in history. They handled a much larger freight business in May, 1923, but the average number of cars per train was only 40.7. The nearest approach ever made to the record of May, 1924, was in October, 1923, and in April, 1924, when the figure was 41.3.

While handling this record breaking number of cars per train in May, the railways moved freight trains an average of 11.8 miles per hour. This also was almost a new record, the highest previous record being 11.9 miles.

This record breaking average number of cars per train was not the result of any sudden change, but of a gradual and steady increase in efficiency of operation. The average number of cars per train in 1920 was 36.6; in 1921, 38.4; in 1922, 38.5; and in 1923, 39.9.

In the first five months of 1924 it was 40.4, as compared with 38.5 in the corresponding months of last year, the increase being 1.9 cars per train. This may not seem important, but let us consider its effect upon certain operating expenses of the railways. If in the first five months of the year they had handled only the same number of cars per train as in the first five months of 1923 they would have had to have run freight trains 11,000,000 miles more than they actually did to handle the business. The Interstate Commerce Commission compiles certain unit costs of operation which include locomotive repairs, wages of enginemen and trainmen, fuel for train locomotives, engine house expenses and other locomotive and train expenses. Although the average number of cars per train was greater than in the first five months of 1923, these unit costs per train mile were less, totaling \$1.85 in the first five months of 1923 and only \$1.66 in 1924. Therefore, it is reasonable to conclude that every train mile saved involved a saving of \$1.66 and that in consequence the saving of 11,000,000 train miles amounted in money to over \$18,200,000, or at the rate of about \$44,000,000 a year.

If we carry the comparison back ten years to 1914, it becomes much more striking. In 1914 the average number of cars in each freight train was 33, or 7.4 less than in the first five months of 1924. If the railways in the first five months of 1924 had averaged only 33 cars per train the number of freight trains run one mile to handle the business would have

been 48 million greater than it was, and the costs mentioned would have aggregated 80 million dollars more than they did, or at the rate of 200 million dollars a year more.

Nor are these large annual savings the only ones that are caused by increases in the number of cars handled in each train. The reduction in the number of trains that have to be operated which results from increasing the number of cars per train reduces the amount of train dispatching that has to be done; reduces the number of passing and meeting points of trains, thereby increasing the capacity of existing tracks and reducing the amount of new trackage that has to be provided and the fixed charges on the investment that would result; and in fact curtails operating costs and fixed charges all along the line. It seems highly probable that if it were possible to calculate all the savings resulting from the increase in average cars per train, it would be found that the increase in 1924 over 1923 is saving the railways at the rate of 70 million dollars a year and that the increase in 1924 over 1914 is saving them as much as 300 million dollars annually.

Those who are not familiar with the development and operation of railways might inquire why, if increase in the average number of cars moved per train has such a great effect upon operating expenses, it has not been accomplished more rapidly? The answer is that it requires so many improvements in physical facilities and in operating methods that it can be accomplished only gradually. An increase in the number of cars in a train gives the locomotive more tons to pull. In order that locomotives may pull larger tonnage it is necessary to provide larger and more powerful locomotives or to reduce track gradients or both. Heavier locomotives require stronger tracks and bridges, longer turntables, larger engine houses, etc. Increases in the length of trains require increases in the length of passing and yard tracks. The longer and heavier trains are the stronger cars must be built in order to prevent trains from pulling apart. Now, the provision of heavier and more powerful locomotives, the reduction of grades, the lengthening of passing and yard tracks and the provision of stronger cars all require capital expenditures, and therefore before these improvements can be made the railways must be able to raise and invest adequate amounts of new capital.

Furthermore, after better physical facilities have been provided it is necessary to make improvements in operating methods in order to utilize the improved physical facilities to the best advantage. The problem of so assembling cars and making up and moving trains as to secure the maximum train load, while at the same time maintaining and increasing the average miles that freight cars are moved daily, is one of great complexity and difficulty, and constantly taxes the efficiency of the transportation department of every railroad.

The increase of railway efficiency illustrated by the increase in the average number of cars per train throws light upon two points that have been the subject of a good deal of controversy. Over and over again it has been charged, since Mr. Brandeis in 1910 made his famous assertion that the railways by more scientific management could save a million dollars a day, that the railways are inefficiently operated. The best evidence that this charge was without foundation when it was made, and has been without foundation ever since, is the steady improvement in operating results which was being secured before it was made and which has been secured since. It has also been said, even by some railway men, that the economies that can be effected by increasing the average train load are being exhausted. Nevertheless, large economies continue to be effected in this way. Their continuance within recent years has been largely due to the improvements that have been made in locomotives. These improvements in locomotives have largely made it possible both to increase the average train load and to move the longer and heavier trains at increased speed.

The opportunities for increasing the efficiency and economy of operation—for increasing the average train load and at the same time maintaining or increasing the average speed of trains—by replacing many comparatively obsolete and inefficient locomotives with more powerful and efficient locomotives, and making other physical improvements are still great, and no better evidence of this could be afforded than what has been accomplished within recent years.

Railway Traffic Forecasts

THE ARTICLE entitled "Railway Freight and Passenger Traffic Forecasts" appearing on another page of the present issue performs the function of comparing the various methods suggested for estimating the probable volume of railway traffic in the next ten or twenty years. L. A. Abbot, the author, is a statistical analyst on the staff on the Interstate Commerce Commission.

The study has not been prepared as an official document of the commission or of any of its bureaus. It is reasonable to suppose, however, that its publication has official sanction and that hope is held that further discussion of the subject may be elicited. It is fitting that the article should appear in the columns of the *Railway Age* because it deals with a subject that has received considerable attention in the columns of this paper in the recent past as will be observed from the notations appearing in the first few paragraphs. Mr. Abbot in his study emphasizes, quite naturally, the wide divergence of the various forecasts that have been made of the probable future volume of railway freight ton-miles and passenger miles.

He offers the general conclusion that it is a case of judgment as to which of the several methods of forecasting gives the most likely result. However, he also points out that he is not impressed by such forecasts as embody consideration of the growth of population factor. He refers to it in his comment on the ton-mile forecasts as being possibly "an unnecessary element." A feature of the comparisons presented that will not escape notice—it is particularly evident on the chart—is the fact that the estimates of future freight ton-miles prepared by the Interstate Commerce Commission are the lowest of any. The I. C. C. estimate was criticized by many as being too low when it was offered in 1921. Possibly there will be many who will feel inclined "to view with alarm" the significant fact that our leading regulatory body takes the most conservative stand of anybody as relates to the future volume of railway traffic. Does it mean also that the commission is inclined to take the most conservative view of anybody as to future railway needs?

The *Railway Age* has published in the past few months a considerable number of articles on the subject of forecasting the future volume of railway traffic. The articles place themselves in two entirely separate groups. In the one group belong such articles as that by Mr. Abbot which, as noted above, is a summation of several articles previously published in this paper or elsewhere on the forecasting of the volume of railway traffic ten or twenty years in the future.

In the other group belong such articles as those by Professor Homer B. Vanderblue of Harvard University published not long since in the columns of the *Railway Age* under the title of "Railway Traffic and the Business Cycle." Professor Vanderblue's articles dealt also with forecasting but the forecasts discussed were those of three to six months ahead.

Thus one group of articles on the subject of forecasting has dealt with the long-time trend and future growth of railway traffic whereas the articles in the other group have dealt with the short term fluctuations that result from the ups and downs of industrial prosperity. The two classes

of articles deal, therefore, with entirely distinct and separate subjects. They are not related except remotely and it is only by chance that both series should have been run in the *Railway Age* at approximately the same time. Discussion of forecasting—whether for the long term or for the short term—may seem to many hard-headed practical railroad officers to be a very theoretical subject indeed. It is noteworthy, however, that unusual interest in the subject has been evidenced.

The forecasting of future industrial growth and study of future trends of the ordinary course of business have of late become important factors in American industry. This is shown in no better way than by the elaborate statistical organizations of many of the larger industrial concerns and notably by those of the various federal reserve banks. It is probably true that the interest in forecasting that has been shown by railwaymen is rather less than that which has been shown by leaders in various other lines of industry. The fact that the statisticians are having marked success in certain industries with the work indicates that mathematical analysis of statistical trends with a view to indicating future possibilities must have merit. Railway executives will not readily agree that forecasting of future railway traffic volume—particularly as relates to the short term fluctuations—is feasible. Nevertheless, if the activity along this line in other industries is any criterion it follows that the railways should give the matter study. If forecasting of railway trends is not found possible—well and good. At least the railways will have satisfied themselves to that effect and found that conditions in their industry are different from those in any other. If forecasting is found possible it will prove to be one of the most important subjects towards which future railway analysts will have to direct their efforts.

Groping in the Dark

STRUCTURAL ENGINEERING is known as one of the most exact of applied sciences. The work of the structural designer is founded on a more complete knowledge of the physical facts and is less dependent on cut and try methods than that prevailing in most other branches of engineering. This is particularly the case with respect to the design of steel, wood and concrete bridges and buildings. When, however, the designer deals with culverts buried in varying depths of embankments, he is compelled to pass from exact knowledge to rather devious speculation. He is confronted with a dearth of facts concerning three important factors: the effect of the weight of the embankment, the distribution of the live load through the fill and the dissipation of the live load impact.

As to the first consideration there is a conflict of opinions between those who are convinced that each foot of embankment height adds another 100 lb. of load to the culvert top, and those who believe that some sort of arch action in the embankment relieves the culvert of a part of the load. The second factor has called forth various assumptions as to the so-called live load spread, under which the train load is considered as distributing over an increasing width of the embankment with each increment of height, the rate of this spread being subject to a diversity of opinion. When it comes to the last factor, impact, we find almost no two designers in agreement, the number of widely differing assumptions practically equaling the number of engineers consulted.

The reason for this is plain. No one has any real test data to support his conclusion. Of course, there is always the answer that the design must be sound since no failures have occurred in the structures built, but this position is not consistent with the principles of scientific engineering for the absence of failure demonstrates only one fact, the adequacy of the design. While it may prove that the structure

is strong enough under all conditions, it does not prove that it may not be grossly extravagant under some circumstances.

What is the answer? Thus far efforts to solve these problems have been confined largely to speculative mathematics. It is true that some work has been done in the direction of actual experimentation, but this has not been conducted on a sufficiently broad scope to develop conclusive results. There is a genuine need for real facts concerning not only the pressures imposed by embankments but also with respect to the behavior of culverts, under load particularly those constructed of pipe. The railroads can perform a valuable service in the interests of engineering knowledge having a direct application to their own needs in supporting experimentation along this line.

The Train-Stop Re-enters the Field

BY REINSERTING the permissive feature in the specifications for the train-stop and suspending the second order as it affects the 42 new roads mentioned in the order, the commission, by its decision of July 26, has taken train control out of the haze of idealism and has placed it on a more workable basis. Commissioner McManamy in his concurring opinion accompanying the report summarized the situation clearly in his statement that "installations should be required in such a way as to suit the needs of the particular carrier—different treatment for different roads and parts of roads depending upon the facts in each case. The installation of train control might be proper in one case and unreasonable in another because of differences in the speed of trains, density of traffic, financial conditions, etc. The installation of automatic block signals on certain divisions of light or medium traffic density would be sufficient. The installation of automatic stops with the permissive feature at certain locations would undoubtedly meet the needs for many years. The installation of train-control, developed to the point of reliability and practicability, should without doubt be required as an additional safeguard on the busiest passenger divisions."

The *Railway Age* has already advocated the recall of the second order, pointing out the unreasonableness of the extent and duplication of installations for which it called in view of the present state of the art of train control. The recent decision to suspend the second order as it affected the 42 roads mentioned for the first time in this order will concentrate the development and reduce the duplication of effort.

In studying the orders of the commission it must be borne in mind that the term "train stop" applies to the simple system that stops the train automatically at a danger signal; whereas the term "train control" applies to apparatus that includes speed control in addition to the stop feature. Paragraph *b*, which has just been reinserted under the head "train-stops" reads as follows: "(b) Under control of the engineman who may, if alert, forestall the application of the brakes by the automatic train stop device and control his train in the usual manner in accordance with hand signals or under limits fixed by train order or prescribed by the operating rules of the company." In the requisites prepared by the Joint Committee on Train Control in 1921, this paragraph was included. When the order of the commission was issued in 1922, it was omitted. At the time the proposal for this order was issued in January, 1922, and at various times since, the *Railway Age* has advocated the reinsertion of this permissive feature for the simple train stop. It has been our contention that during this stage of train control development the simple train stop would afford adequate protection on roads with comparatively light traffic, and that the

best results could be secured by extended comparison between different systems installed under different conditions.

With the permissive feature eliminated from the specifications of the original order, many carriers no doubt considered that any train-stop system that required a full stop at all signals indicating danger would limit the track capacity and at certain points might result in stops that would be objectionable. Such stops would be particularly objectionable in tunnels, on long grades or at braking distance from the head-in switch of a single track line when a second train was holding the main line. These reasons have, no doubt, influenced some of the carriers to adopt systems including speed control and some roads may now consider the substitution of the more simple train stop.

The reinsertion of the permissive feature for the train-stop does not, however, bring the train-stop into the same class with the train control with its speed control features which is acknowledged as providing greater safety. Those roads that have a traffic sufficiently heavy to justify the expenditure will do well to proceed with the train control installations as planned. To do otherwise would discourage development and might provoke the commission to more drastic action. The success of the policy of the commission as outlined by Commissioner McManamy is dependent on the co-operation of the carriers. Without further delay automatic signals should be installed where traffic is heavy enough to show results because of the increased track capacity and added safety. The train stop or train control can then be added as traffic demands. The opportunity is now open for the carriers to do their part in keeping train control on a reasonable economic basis, and the opportunity should not be lost.

Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

A City Plan for Springfield, Mass. Report by the Planning Board. "Railroads," p. 41-58; "Transit," p. 92-103; "Water Front Development," p. 122-130. 212 p. Illustrations, Maps, and Diagrams. Pub. by the Planning Board, Springfield, Mass.

Handbook of Mathematical Statistics, by H. L. Rietz, Editor-in-Chief. Includes discussions of mathematical memoranda, correlation, index numbers. 221 p. Pub. by Houghton, Mifflin Co., Boston and New York. \$4.00.

A New Chapter of Erie. "This story of rehabilitation is the New Chapter of Erie under a management which has prevailed for upwards of twenty years," p. 16. 16 p. Pub. by James H. Oliphant & Co., New York and Chicago.

Periodical Articles

Applying the Budget System to Railroads, by Henry Bruere and Arthur Lazarus. A review of present practice and forecast of future possibilities. *Industrial Management*, July, 1924, p. 35-46.

Dividends from Stockholder's Viewpoint. The Relations of public, management and shareholders, by M. H. Wilson. *Barron's*, August 4, 1924, p. 11.

Freight Train Formations, by H. R. Griffiths. "Originally the word 'freight' was used chiefly in relation to a ship's cargo, but, following American practice, it has, in later years, been more generally adopted by railways to include what were formerly described as goods (or merchandise), minerals and live stock traffic, and is a useful addition to train nomenclature," p. 416. *Journal of the Institute of Transport*, July, 1924, p. 416-434. Discussion, p. 434-440.

Motor truck and box car, by Edward Hungerford. Motor freight services of various railroads. *Country Gentleman*, August 2, 1924, p. 9, 30.

A Railroad in the Making. Seaboard Air Line Still Growing in Size and Strength. Historical sketch. "The Seaboard of today is a consolidation of 103 railroads," p. 2, col. 1. *Barron's*, August 4, 1924, p. 3, 6-7.

New Books

The Business of Railway Transportation. By Lewis H. Haney, Ph.D., director of the New York University Bureau of Business Research. 613 pages, 5 in., by 7½ in., bound in cloth. Published by the Ronald Press Company, New York.

This book combines the functions of a useful, practical, and interesting text-book on the railway business and the economics of railway transportation with a discussion of the present-day public relations of the railway business and an effort to bring about a fuller appreciation of the fact that railway transportation is a business, subject to economic laws. The aim is to present a practical discussion of those matters pertaining to the railway business which particularly concern shippers and traffic men while keeping in mind also the interests of the investor on the one hand and on the other hand those of the thoughtful citizen who desires a right relation between carrier, shipper and the general public. The first section is devoted to a general description and analysis of the railway business. After a brief presentation of the importance of transportation and the nature of the railway machine, chapters on the internal organization of a railway, on railway accounts, and on statistics, supply a foundation for an understanding of railway operation and traffic problems. They are followed in a second section by a discussion of railway geography and in the third and fourth sections by a treatment of railway rates. This includes the principles of rate-making and a discussion of the demand for and supply of transportation as affecting the value of the transportation service and a description of rate-making in actual practice. The fifth section deals with various traffic matters, such as the shipping of freight, reconsignment, demurrage, freight claims, and the terminal problem and an appendix contains a number of problems to be solved by the student in such a way as to lead him to form business judgments similar to those required in practical dealings with the railway business.

In the concluding section, dealing with railway regulation, the issues of railway consolidation, railway labor and government ownership are taken up. It is the author's judgment that the Transportation Act of 1920 is a wise and constructive attempt to deal with the railway problem by means of regulating privately owned and operated railways, and that it merits a careful trial of sufficient length to demonstrate conclusively whether or not such an attempt can succeed. If not, he says, an unhappy marriage of politics and business is probable. "Either we must assume more responsibility for the efficient functioning of the railways," he says in conclusion, "by such means as dealing firmly with railway labor and strengthening railway credit as required, or we shall have to assume through the government the initiative which we now expect from private management. It is to be hoped that our citizens will have sufficient vision to take the former course, and that the intelligent self-interest of private railway owners will lead them to co-operate." It is always desirable in a country such as ours—and it is still possible—to keep railway transportation on a business basis."

Letters to the Editor

* [The RAILWAY AGE welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

The Application of Cost Depreciation and Decretion

SALT LAKE CITY, Utah.

TO THE EDITOR:

In its tentative valuations of railroad properties the Interstate Commerce Commission has reported all deterioration existing in each article of a carrier's property as "Depreciation" (Bureau's Circular No. 226). One carrier's entire property may consist of a steel bridge or a terminal station in effect to be retired and renewed at a finite time in the future, as in the case of hotels, apartment houses, factories, etc., while another carrier's property may consist of independent component units which in effect will be renewed as retired at equal annual cost, and examples representing every phase between these two extremes; yet the total deterioration from new is reported similarly on all property as depreciation.

To illustrate the different conditions affecting each carrier as to maintenance, take two properties as of date of valuation disregarding salvage values:

One single unit property consisting of one article, or a number of articles so related that retirements will be simultaneous:

Reproduction cost \$100,000.
Age 5 years.
Estimated life 10 years.

It follows that this property must be maintained by a retirement and renewal in five years at a cost of \$100,000, while depreciation charges allowed from earnings during that time can only be \$50,000. Therefore \$50,000 of this retirement cost cannot be taken from its earnings from date of valuation to date of retirement.

The other composite property consists of many units each retired independently and at an equal cost per year, all as reported on the single unit property as follows:

Reproduction cost \$100,000.
Average age from new 5 years.
Normal life 10 years.

Therefore this property can be maintained indefinitely by a retirement and renewal cost of \$10,000 per year which can all be taken directly from earnings.

Eliminating all other elements of value according to tentative valuations now being served, each of these properties would be reported:

Reproduction new \$100,000.
Reproduction less depreciation \$50,000.
Value for rate-making purposes \$50,000.

It should be plainly seen that on valuation date the owner of the single unit property must furnish from his own assets \$50,000 in order to place the single unit property on the same basis for serving the public as the composite property.

On the single unit property the total deterioration from new of \$50,000 reported as depreciation is cost depreciation and it directly affects value for rate making purposes, because under present or proposed accounting specifications the future maintenance of the property cannot be taken or pro-

vided from subsequent earnings, to the extent of this cost depreciation.

On the composite property the total deterioration from new (\$50,000) is decretion and it has no effect on value for rate making purposes because under present or proposed accounting specifications the future maintenance of the property will be fully provided from subsequent earnings.

Whether or not my interpretation of the effect of each on a rate base is sustained, both cost depreciation and decretion, according to tentative valuations as now reported, are elements of value. Each can be computed from the Bureau's estimated life notes with the same degree of accuracy as the bureau computes the total deterioration from new, and this at a comparatively small cost.

Commissioner Eastman evidently had this view in mind in his dissenting opinion San Pedro, Los Angeles & Salt Lake, Valuation Docket No. 26, page 558:

"In my judgment depreciation should be deducted from 'value for rate-making purposes,' where a property has been well maintained, to the extent that it is necessary in successful operation to create a reserve fund for protection against depreciation. Viewed in this light, I am led to the conclusion that the deduction which the majority have made for depreciation in estimating cost of reproduction less depreciation may be too large. If, for example, ties have been properly maintained, a deduction of 50 per cent for depreciation impresses me as theoretical rather than real."

The Valuation Act, Section 19-A provides that the Interstate Commerce Commission,

"shall in like manner ascertain and report separately other values and elements of value, if any, of the property of such common carrier."

These two indisputable elements of value, cost depreciation and decretion, separately, contrary to the terms of the foregoing quotation from the valuation act are omitted from all tentative valuations and therefore do not appear to be reflected in value reported for rate making purposes.

MARCUS A. ROBY.

A Defense of Mr. Bruère's Paper

ELDON, Mo.

TO THE EDITOR:

I have read with a great deal of interest the contributions of the prize winners in the recent contest on co-operation conducted by the *Railway Age*, and believe that they will have a real value in stimulating more active interest in establishing the Golden Rule as a fundamental principle in industrial relations. I was, therefore, greatly surprised to read H. P. Dreyer's criticism of the article which was awarded the first prize, and amazed that such a conclusion could be reached as is expressed by him in the issue of the *Railway Age* of July 19.

Mr. Dreyer's view that the prize winning article is devoid of any practical suggestion is not, I am certain, concurred in by those who recognize the benefits derived from co-operation, the Golden Rule, and the budget system applied in the home. If these three essentials are not practiced to some extent at home those of such homes cannot appreciate their value in shaping a pleasant relationship between employer and employee, but I feel certain that there is not a single home in which at least one of these essentials is not practiced.

As one of those in the field, there is seldom a day passes in which I do not hear from a conductor, a trainman, a switchman, an engineman or others, an expression of satisfaction with respect to each improvement here and there in the way of better facilities, a stretch of new rail, an extension of a siding, a successful movement of a special passenger train, a large volume of freight business, a successful effort—or just an effort—towards the routing of freight or a passenger over our railroad, or a word of praise that they have heard from a patron. I also find the purpose and values of the budget system penetrating offices on the line to which it has heretofore been a stranger, and, to my great satisfac-

tion, it is found that the longer it remains with them the better they like it.

A glance at Mr. Bruère's experiences will disclose that his life has, for the most part, been devoted to an effort to help men know themselves. It is hardly probable that he had a selfish motive in writing the article on co-operation. He did not write from the standpoint of an executive in the sense suggested by Mr. Dreyer, but from a natural desire to improve the relationship between employers and employees, and his remarks were based upon experience in handling employers and employees, in which both have greatly benefited from the practice of co-operation.

I look forward with confidence to the very near future when it will be more generally recognized that railroad executives and officers are just human beings and love the same things that all of us love.

Based on my long experience as one of the "rank and file," I am convinced that there is nothing so well calculated to accomplish the very thing that Mr. Dreyer advocates, as intelligent, sincere personnel work. There is no factor more important to the railroad employee than security in employment, and there is no better way that I can conceive of to make continuous employment possible than to work out a plan which will overcome seasonal and financial fluctuations resulting from variations in volume of business and consequent income, and the availability of funds to furnish material and pay wages.

A budget must necessarily deal with statistics and the advance planning of a work program, but it is vastly more than that, and the human equation of continuous employment which such a plan contemplates is one of the important basic reasons for such a program.

The Golden Rule is a principle which can and should be applied in our every-day lives and in all of our contacts, and I have no doubt that the judges of the contest recognized, as I do, that the article which was awarded first prize outlined a splendid program calculated to bring about the practical application in every-day activity of the Golden Rule, a closer human relationship, and a better mutual understanding.

C. H. CARTER,

System Transportation Inspector, Rock Island Lines.

Mr. Bruère's Plan a Method for Applying the Golden Rule

NEW YORK.

TO THE EDITOR:

I have been interested in Mr. Dreyer's letter in your issue of July 19 because I too have made an analysis of Mr. Bruère's article on co-operation on the railroads. While Mr. Dreyer offers the golden rule in the abstract as a solution for this problem, Mr. Bruère presents a plan for working out the same principle according to modern business management methods.

Let the railroads make the workers' jobs secure, he suggests, by first making the railroad as a whole secure.

Let them enlist the help of the men themselves in making the conditions of work safe and healthful; let them, by careful selection, attract to the railroads the right type of men and then encourage them to make the most of their opportunities by recognizing such effort. Let them do their part in making available educational and recreational facilities and let them bear their share of the burden brought about by illness and death.

Let them study modern management methods and provide the best tools and equipment available so that the workers, in turn, may by taking a just pride in their work, render the best possible service.

Let them give the workers some interest in the railroad out-

side of the mere wage interest—by sale of stock, where wise from an investment standpoint, by enlisting the aid of the men themselves in securing new business and by giving them all the facts in the company's situation.

To accomplish these aims, Mr. Bruère provides practically for the necessary machinery. He suggests the budget as a means for inspiring progress in the direction of an all-year schedule for the road, with resulting all-year jobs for the men; the adoption of a personnel department under adequate management to look after employee interests and conferences between management and workers to further mutual understanding.

This revived interest on the part of employees will result in greater production because of the gain in general good will. And because it is provided that both factors shall share in such benefits, it is really each doing for the other what they would want the other to do for them.

This, as I see it, is a practical working out of Mr. Dreyer's own solution of the golden rule. This article goes a step further and suggests that the ancient code, practically enforced, is really very good business for all concerned.

L. A. TAFEL.

Depreciation Correctly Computed

CHICAGO.

TO THE EDITOR:

I have followed with interest the discussions on "Decretion" and depreciation. The fact that the total deterioration of a composite property has two phases (viz.: decretion, a perpetually deferred liability and depreciation, an eventually maturing liability) has been clearly analyzed but no progress has as yet been made in the attempt to put the results to practical use. Decretion as a deductive is still sanctioned by the courts in finding "value for rate making purposes." Accounting ethics still prescribe that you shall charge off decretion in finding net operating income.

It is the claim of the railroads in valuation proceedings that decretion shall not be deducted. There is no better way to force this just and rightful claim than to secure the revision of current accounting methods to coincide therewith.

The Interstate Commerce Commission's classification of accounts is soon to be revised. Let the revision take cognizance of this two-part concept of deterioration. Let there be three (properly named) accounts prescribed, viz.: (1) "Accrued Deterioration," (2) "Decretion," and (3) "Depreciation."

(1) "Accrued Deterioration," a normal credit balance (balance sheet) account representing the lessening of service life computed by straight line, sinking fund or other approved formula.

(2) "Decretion," a normal debit balance (balance sheet) account representing the portion of accrued deterioration which (in a composite property) never reaches replacement maturity.

(3) "Depreciation," a normal debit balance (expense) account representing the charge to operation on account of property replaced (not to be confused with the present account of the same name).

To illustrate the use of these accounts take the simple utility cited in Mr. Roby's letter of December 22, 1923. A man buys two automobiles A and B for \$1,000 each, A in 1900 and B in 1905. Both autos have a 10-year life expectancy. Assume a fiscal period of 10 years during which time \$12,600 have been received as revenue and \$10,000 expenses have been spent, except for the replacement cost of Auto A.

The income statement for the 10-year period ending 1910 would appear thus:

Gross revenue.....	\$12,600
Deduct expenses:	
Account of operations.....	\$10,000
Account replacement "A".....	1,000
	11,000
Net operating income.....	\$1,600

The balance sheet as of 1910 would be as follows:

Assets	Liabilities
Autos "B" and "C".....	Capital.....
Less accrued deterioration.....	Surplus.....
Depreciation.....	
Cash.....	
\$3,600	\$3,600

For simplicity assume reproduction new as of 1910 equals original cost. Then the rate-base of the utility is: Cost of reproduction new \$2,000 less accrued deterioration \$500 plus depreciation \$500 equals \$2,000. The earning of \$160 per year is a "fair return" of 8 per cent.

The adoption of these principles in accounting would serve two useful purposes. It would nullify the contention that there is one depreciation (so-called) for accounting purposes and another for rate making purposes. It would hasten the approval of a method for finding value, fair and just to the public and carrier alike.

RAYMOND C. KRAMER,
Valuation Accountant, C., M. & St. P.

Commends Mr. Bruère's Paper

CHICAGO

TO THE EDITOR:

I regret that other matters have prevented my earlier expression of pleasure in reading Mr. Bruère's prize article in your contest on "Co-operation."

The splendid recognition of the human factor in the railway problem which his plan implies appeals to me very forcibly.

It is admirably directed toward a better appreciation by each, of the difficulties confronted by those charged with the duties of management and the great army of men and women who provide our transportation service, and is calculated to establish and maintain a better mutual understanding and sense of joint interest and responsibility.

You are to be congratulated upon the distinct contributions to the study of this very important matter which your contest has produced.

F. W. SARGENT,
Vice-President and General Counsel, Chicago & North Western.

Depreciation and Reserves

BANGOR, Me.

TO THE EDITOR:

There is much that is of interest contained in the testimony presented before the Interstate Commerce Commission at its hearing in regard to depreciation of fixed railway property, Docket No. 15100, as well as in various articles upon that subject that have appeared from time to time in the *Railway Age*.

Briefly summarized, the principal arguments against setting up a depreciation reserve along the suggested lines to provide for loss in service life in connection with fixed railway property seem to be:

That such property when adequately maintained, considering the whole railway system as the unit and on a going concern basis, really contains no element of loss of service life; that is, that maintenance completely off-sets the effects of wear and tear and the action of the elements, so that the property as a whole could be made to forever go on functioning as originally intended unless destroyed through casualty or voluntarily retired from service because of inadequacy

or obsolescence; that the regular setting up of such a reserve as recommended would result in a large and unnecessary accumulation of money, if the reserve be funded, otherwise in a segregation of surplus through a book account, that would be definitely earmarked and unavailable for general use; that a rigid rule adhered to without regard to business conditions would result, in times of depression, in presenting a poorer showing than would otherwise be the case and so might greatly impair credit at a most inopportune time; that any bases adopted for determining the amount of depreciation to be charged off would necessarily be predicated upon guesses as to length of service life and salvage values; and, finally, that the public must pay with real money, through rates, for this theoretical loss, or there will be no surplus to build up a depreciation reserve out of.

We have abundant evidence that there is such a thing as depreciation that cannot be entirely eliminated through maintenance. If we could now stop all progress and new construction, merely maintaining the property at present in existence, it would be only a matter of time before every machine, tool, structure, etc., would, like an old shoe, come to the point where it could no longer be successfully repaired and would have to be scrapped. Property would thus disappear more or less quickly according to its construction and use.

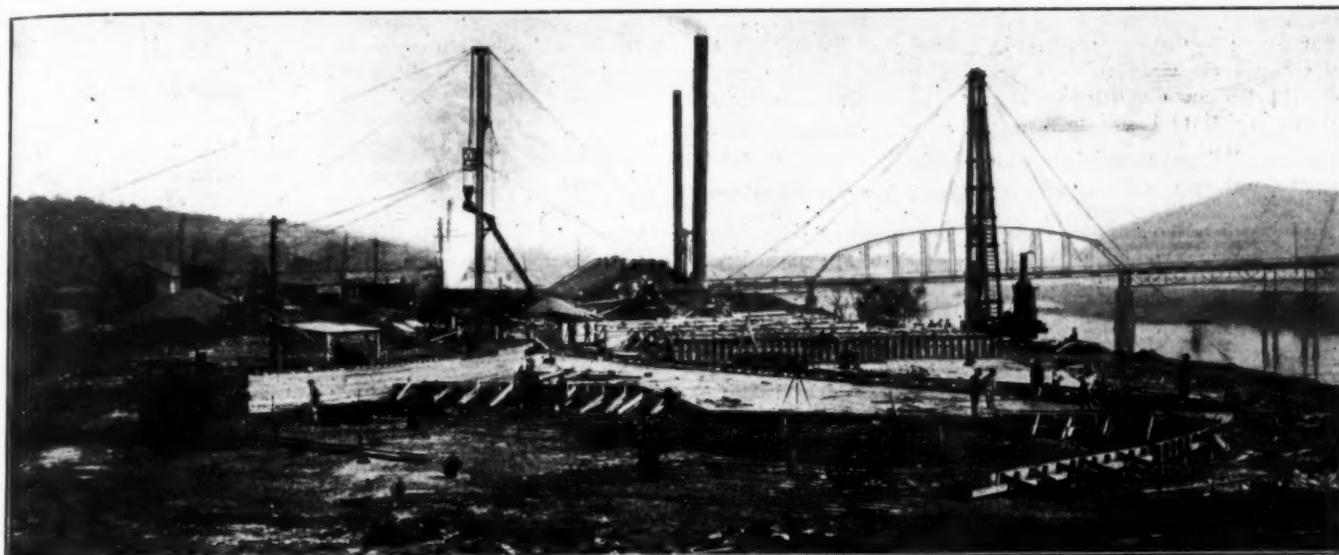
Conceding the fact of such a continuous although gradual and sometimes almost imperceptible loss, it seems only fair that railroads be allowed net earnings enough to reimburse the owners, in some part at least, for it. The question is how to measure; how to find a common ground upon which the practical man, with his eye on revenues and expenses, and the theorist, with his mind on estimates and percentages, may meet. If given time, money, and a sufficient force of engineers and accountants, every piece of fixed railway property could be surveyed, costs appraised where not known, and some basis for figuring depreciation arrived at. But this could not be accurate, neither would it be likely to produce results of sufficient value to justify first cost and expense of subsequent record-keeping.

However, it does seem as though a fund to cover estimated depreciation might be set aside from income when and as fast as earnings were sufficient, until that fund had attained in amount to some certain reasonable percentage of the book value of the property, and then could be maintained there by additions and deductions as the investment account fluctuates. This would not, perhaps, be accruing depreciation as that term is technically understood, but it would be a simple and flexible method of setting aside funds.

Suppose that a road with an investment account amounting to \$100,000,000 maintained a depreciation fund amounting to 20 per cent of the investment, or \$20,000,000. If in some year, due to extraordinary retirements, the net decrease in the investment account should amount to \$1,000,000, that fact would automatically release \$200,000 in cash from the depreciation fund. That money is the property of the stockholders, it is a distinct capital asset and should not come into the general cash to be paid out in ordinary course. Its disposition should be left entirely to the discretion of the managing directors who might elect to leave it in the fund to take care of expected future accruals, draw the money and expend it for new equipment or facilities of any kind anywhere, use it in the retirement of bonded indebtedness or in any other way that would reduce capital liabilities, or distribute it pro rata among the stockholders as part reimbursement for loss of original capital.

Such a process would never build up a fund equal to very much more than the determined upon percentage of the ledger value of the property, could be set aside and maintained through a reasonable program made to accord with business conditions, and would protect the investor, which is the chief purpose of a funded depreciation reserve.

W. A. R.



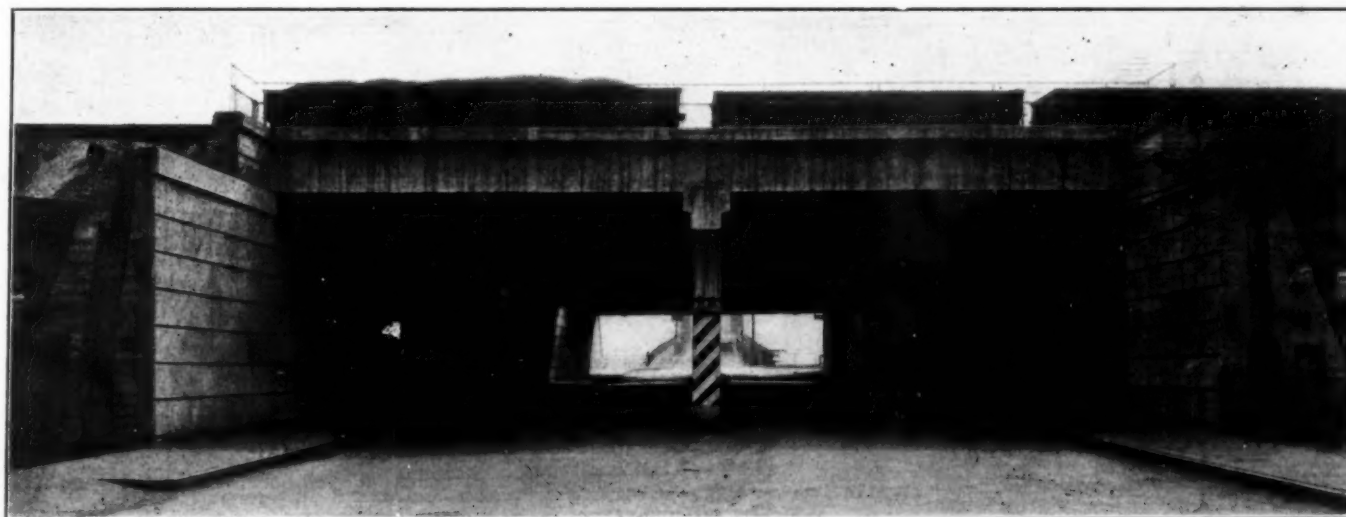
Pouring the Concrete Mattress Under the Enginehouse

Using Concrete Mattresses for Foundations

Pennsylvania Adopts This Type of Construction at New Sharpsburg Engine Terminal Near Pittsburgh

THE PENNSYLVANIA has recently placed in operation a new yard and engine terminal at Sharpsburg, near Pittsburgh, Pa., the enginehouse, turntable, inspection and ash pits of which are supported upon reinforced concrete mattresses. This style of construction not only permitted the

river. A small yard and some car repair facilities had been maintained there previous to the construction of the new terminal. The Pennsylvania operates a four-track line along the north side of the Allegheny river between Pittsburgh proper and the Brilliant branch, the latter being a cut-off



Nineteenth Street Bridge Carrying 24 Tracks

earlier completion of the project but also effected a considerable saving in cost. The mattress covers the entire area under each of the facilities except for a small section under the outer circle of the enginehouse where concrete piles were used. The yard layout is arranged for classification and relay work for freight routed over the Northside line as well as for freight originating in or for delivery to the Pittsburgh district served by this line.

Sharpsburg is located about eight miles from the business district of Pittsburgh on the north side of the Allegheny

river just north of the Sharpsburg yard. This north side line was originally two tracks but was recently expanded to four tracks in connection with grade separation work in order to provide two additional tracks for through east and westbound business. These north side improvements, as they are called, were described in an article on page 7 in the *Railway Age* of July 5. These improvements in addition to already inadequate yards led to the development of a new yard at Sharpsburg. A project of similar importance from an operating standpoint and forming a part of the general im-

provement program in this area was the abandonment of an old and obsolete engine terminal in the heart of the industrial district and the erection of a modern 16-stall enginehouse and all attendant facilities such as machine shop, storehouse and car repair facilities in conjunction with the yard work.

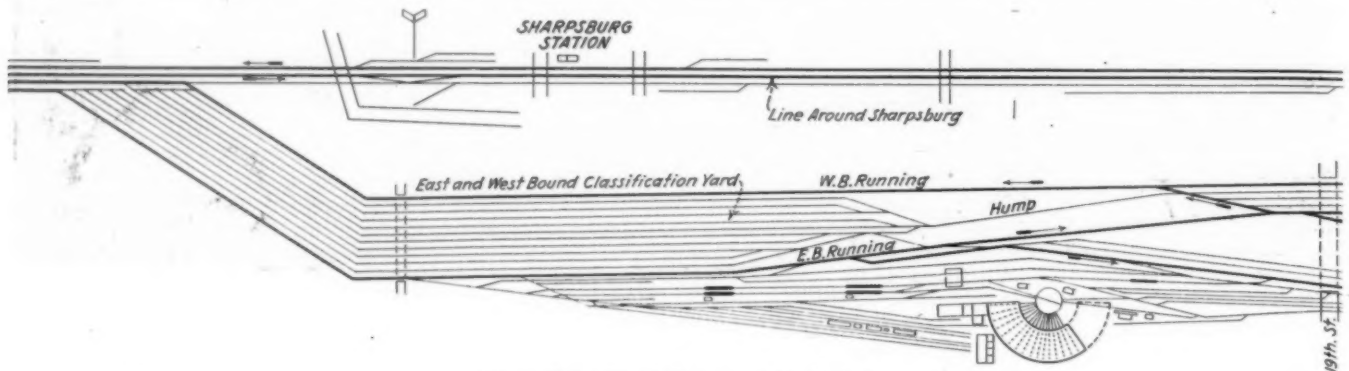
Reinforced Concrete Mattresses Were Used for Foundations

The site selected for the terminal development lies along the Allegheny river and between the river and the main line.

done to prevent any possible settlement or failure of the mattress which might come about with changes in the soil structure along the bank of the river.

The Design of the Enginehouse

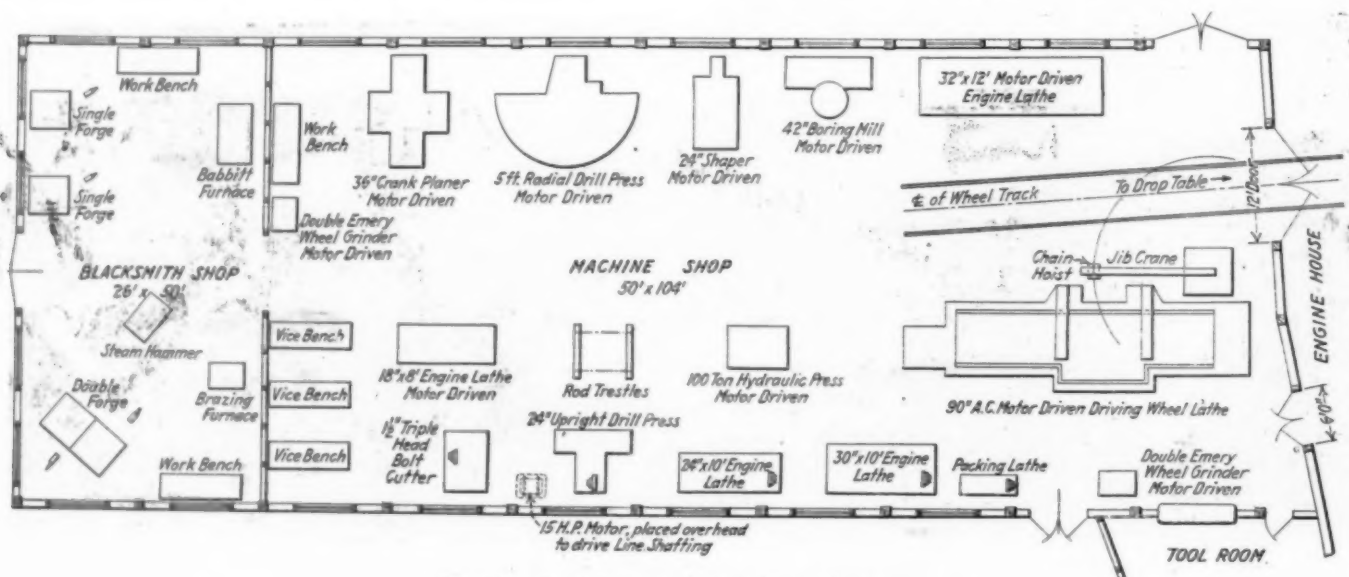
The enginehouse has 16-stalls with concrete engine pits and floor, brick walls and a roof structure of yellow pine mill construction. Provision has been made for a future extension of eight stalls. The length of the stalls is 120 ft. and is divided into six bays of 20 ft. each with bays 4 and



Plan of the Yard Layout—West End

The enginehouse is located about centrally in the area with its outer circle facing on and quite close to the river bank. The land at this point consists of about a 20-ft. cinder and slag fill, seven years old. A study of the soil conditions indicated that concrete piles of a minimum length of 25 ft. would be necessary to secure ample foundation supports. A further study showed that a reinforced concrete mattress could be built advantageously and economically and that its use would permit of a much earlier completion of the project. As it was desired to get this terminal into operation at the

5 from the inner circle carrying a monitor roof with an increase in height of approximately 9 ft. The clearance from floor to eaves at the inner and outer circle is the same or 23 ft. The roof supports consist of 12-in. by 12-in. yellow pine columns capped with 12-in. by 12-in. timbers which in turn carry 12-in. by 12-in. rafters. In keeping with the general type of construction, wooden sash are used throughout in the back wall, in both sides of the monitor over the doors and in the doors. The location of the building directly on the river afforded an excellent opportunity for fine natural



Machine Tool Layout in the Shop Machine

earliest possible date, this mattress type of construction was decided upon. It was likewise found desirable and economical to follow the same plan in designing the foundations for the turntable, and the ash, inspection and repair pits. It was estimated that a probable saving of \$50,000 was made by the adoption of this method. A part of the outer circle of the enginehouse borders directly on the bank of the river and along this section the outer circle wall and the ends of the engine pits were carried on concrete piles. This was

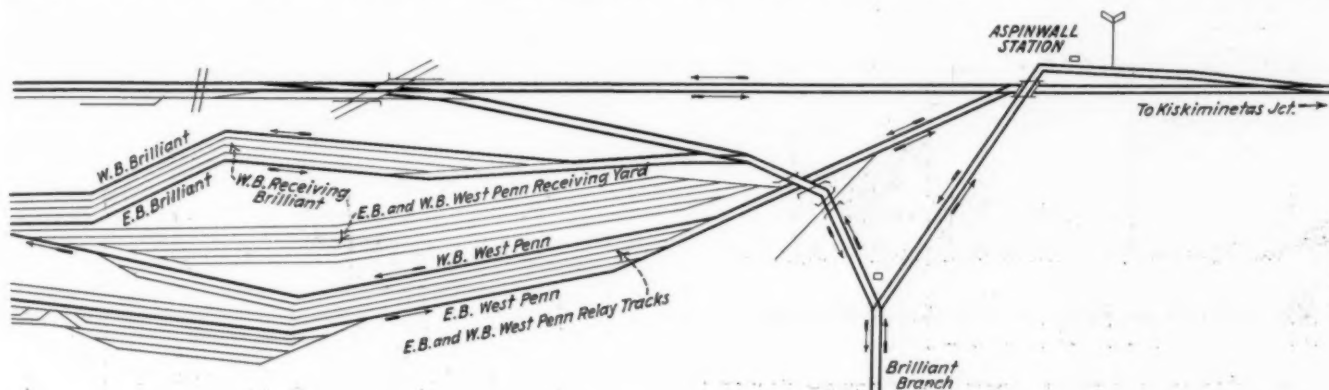
lighting and this condition has been utilized to its best advantage by giving the interior two coats of whitewash which will be renewed as needed. The house is served by a 110-ft. continuous type turntable and approximately 45-ft. lead tracks. As stated, the main foundation for the enginehouse consists of a reinforced concrete mattress approximately 18 in. thick, reinforced with one-inch rods on 18-in. centers lengthwise and crosswise. The upper surface of the slab is 4 ft. 3 in. below the top of rail and directly supports the side walls

of the engine pits, a section of the rear wall and also a number of short 2-ft. square concrete piers to carry the 12-in. by 12-in. roof posts. Only one end of the building has been constructed in a permanent form, the other end being constructed of timber for easy removal when the extension of eight stalls is decided upon. The permanent end is carried upon concrete piers with foundations carried down below the adjoining drop table pit.

These piers support reinforced concrete beams, approximately 4 ft. 3 in. in depth and poured integrally with the

in the outside bay of these three stalls and into the machine shop which adjoins the enginehouse at this point. Stall No. 1; i.e., the stall directly opposite the machine shop is equipped with a 10-ft. electric drop table. In addition to the hand hoists, a Baker electric crane truck with a capacity of 3,000 lb. at a 7-ft. radius, has been installed with a view to determining which arrangement is better adapted for enginehouse service.

The machine shop and blacksmith shop is housed in a 50-ft. by 130-ft. building adjoining Stall I, the tracks of



Arrangement of Yard and Tracks at the East End

piers. This same type of construction was used under the outside sections of the enginehouse not carried on the mattress except that the piers at the pilaster were supported by pile foundations. The piles are driven in clusters of three under each pilaster and also under a few of the outer bay roof posts. Under the ends of the pit walls, they were driven to conform with the line of the walls.

The engine pits are 104 ft. long and drain toward the

which extend into the machine shop. It is a frame structure with corrugated, asbestos-protected metal siding and is equipped to take care of all but the heaviest repairs. About 50 road engines and 20 yard engines are handled at this terminal. Next to the machine shop is a large storehouse building constructed of fabricated steel and measuring 60 ft. by 100 ft. It is arranged with a basement for the storage of heavy parts. An interesting feature of this stores building is



Full Advantage Is Taken of the Natural Lighting

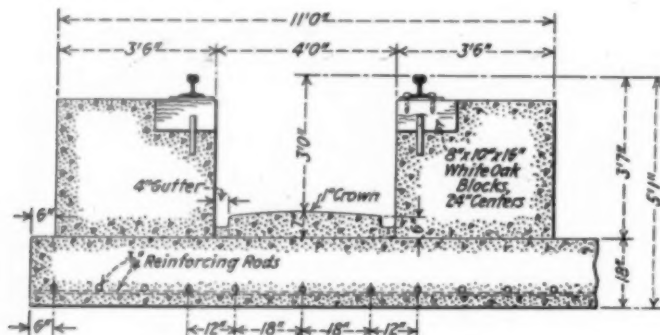
inner circle. The floor is wood block laid on a 6 in. concrete base upon well-tamped cinders. Three of the 16 stalls have been equipped with two-ton monorail hand hoists operating on 12-in. I-beams extending radially over four bays, counting from the outer circle and on either side of each pit. These hand hoists are arranged so that the load can be transferred to a five-ton electric hoist operating on a monorail

the inclusion of a heavy duty freight elevator which serves the first floor and the basement and a car-floor-level platform along one side of the building. Both the basement and the first floor of the storehouse are connected with the machine shop, the enginehouse and other facilities by concrete runways for the operation of electric tractors and trailers. A welfare building, 30 ft. by 100 ft. and two stories in height,

forms the third building on this side of the enginehouse and between it and the car repair facilities which parallel the river bank.

The Ash Pits

The ash pits, two in number, are of the wet type, and are 150 ft. long and 4 ft. wide, inside dimensions. They are spaced 15 ft. center to center and are of concrete, lined with vitrified brick. They rest on an 18-in. concrete mattress 26 ft. wide. The ashes are removed by an overhead traveling



Cross-Section of Outside Repair Pit, Showing Mattress Construction

crane utilizing a $1\frac{1}{2}$ -yd. bucket discharging into hopper cars on an adjoining track. A facility not usually found at engine terminals is two outside repair pits located near the enginehouse upon which light repairs and other light work can be done. These pits are of concrete, supported upon a concrete mattress foundation and are each 100 ft. long, 4 ft. wide inside and approximately 3 ft. deep. Steps are located at each end. An adequate number of electric extension cable sockets have been provided in recesses along the side walls. Other lighting is furnished by rows of reflectors along each side of the pits. The inspection pits are somewhat similar

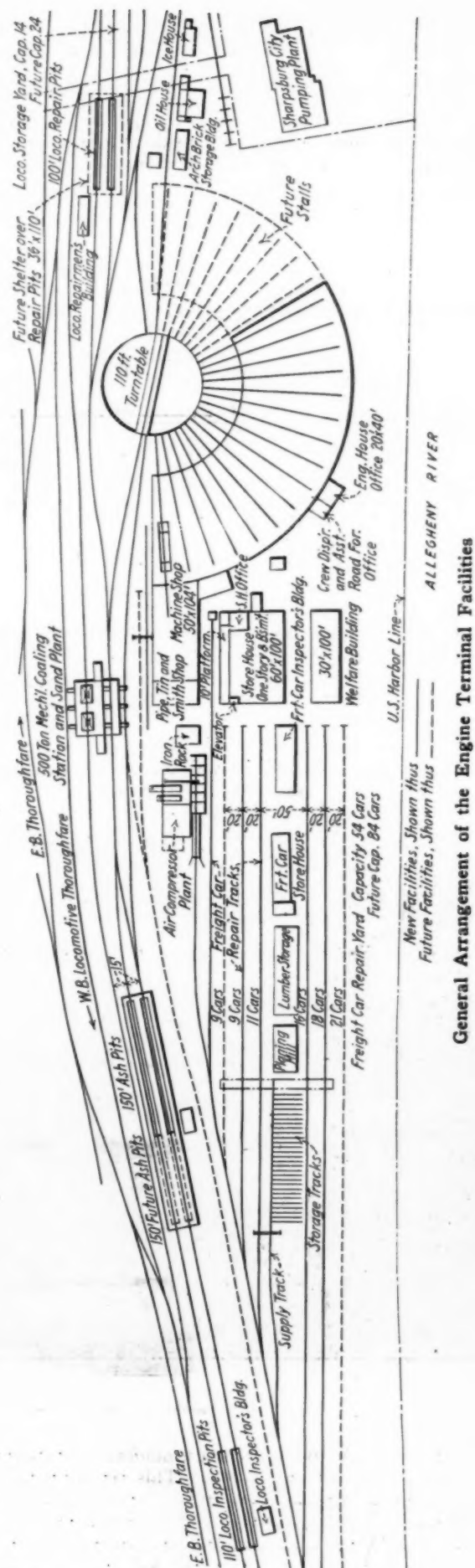


The Ash Pits and Crane Arrangement

to the repair pits, differing chiefly in their depth and thickness of wall. These engine facilities were erected and placed in service in a very short time, the excavation for the project being commenced on August 22, 1923, and the facilities completed and placed in service on April 1, 1924.

Parallels River

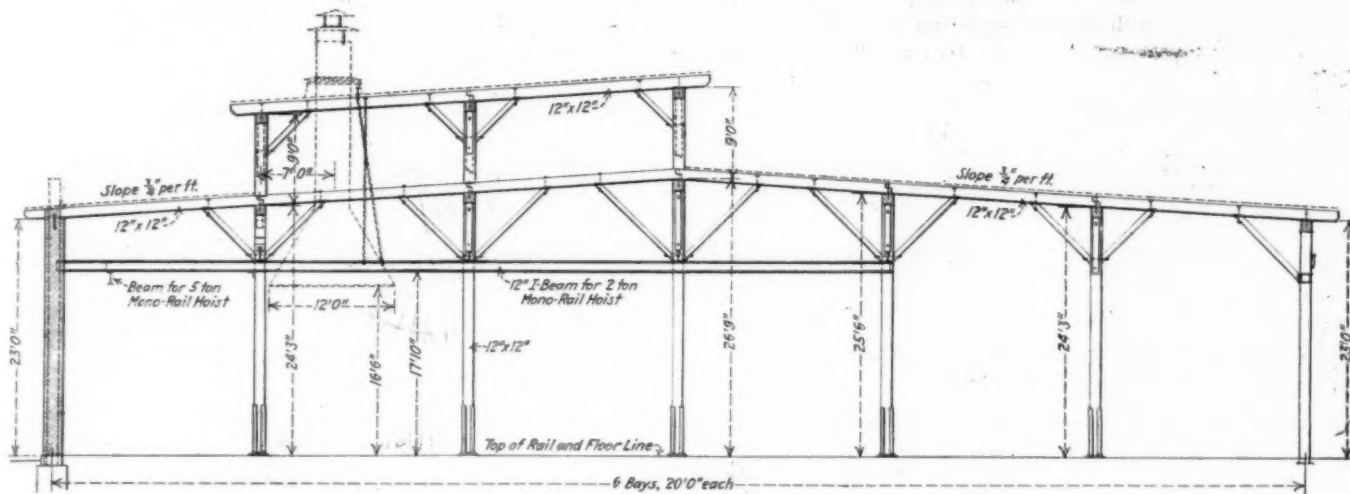
The yard layout parallels the river. On the west end, it consists of a combined east and westbound classification yard of 10 tracks served by a centrally located hump and has a capacity of 605 cars. East of the hump there are two receiving yards, i.e., the westbound Brilliant branch with three tracks and a capacity of 229 cars and a combined east and



General Arrangement of the Engine Terminal Facilities

westbound West Penn receiving yard of six tracks and a capacity of 372 cars. In addition to these small yards there are two eastbound and two westbound West Penn relay tracks with capacities of 199 and 138 cars respectively. Through running tracks follow around the outside of the various yards, permitting of a smooth handling of inbound, outbound and

under the direction of the engineering department of the Pennsylvania, A. C. Shand, chief engineer; Geo. Nauman, assistant to the chief engineer, and T. P. Watson, assistant engineer in direct charge of the work. The contractors for the street bridges and for the grading and trackwork of the engine facilities and yard were M. S. McManamin, Philadel-



A Typical Cross-Section of the Enginehouse

relay trains with no conflicting or unnecessary cross-movements. All through traffic not destined for the yard is bypassed around the yard on the two-track main line which swings around through the town of Sharpsburg. The yard connects with the four-track main line on the west and on the east with the continuation of the two-track line up the river and with the Brilliant branch which crosses the river at this point.

Crossed by Highway

The yard layout is crossed by Nineteenth street, Sharpsburg, one of the main thoroughfares to and from Pittsburgh,

phia, Pa., while the J. F. Casey Company, Pittsburgh, Pa., was the contractor for the buildings and other structures of the engine facilities.

ONE IN 500 MILLION is the passenger's chance of being killed in a train accident in Great Britain, according to the accident report for 1923 as issued by the Ministry of Transport, which shows three passengers killed. The number of passenger journeys was over 1,500 million. The Ministry of Transport, slightly less conservative than its predecessor, the Railway Department of the Board of Trade, has a press agent, and calls the public's attention to this excellent record for safety. This degree of danger, says



The Enginehouse is Served by a 110-ft. Turntable of the Continuous Type

at a point where it would intersect a number of the receiving yard and engine terminal tracks. This condition required the erection of a bridge to carry 24 tracks, the superstructure of which was constructed of reinforced concrete slabs carried on gravity section abutments and a reinforced concrete center pier. Two 20-ft. roadways and 8-ft. sidewalks were provided.

The Sharpsburg facilities were designed by and constructed

the notice, need cause no passenger an anxious thought. The safety of the passenger, says the statement, has become one of the prime considerations of British railway managements, who realize that public confidence is their most valuable asset. The electrical and mechanical safety equipment of the railways is well ahead even of the high standard demanded by the Ministry of Transport. "In no other country in the world are such precautions taken to ensure the safety of the traveler by rail."

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING receded slightly during the week ended July 26 as compared to the high total of the previous week due to decreased loadings of live stock and ore that slight gains in the loadings of other commodities were unable to offset. The week's total was 925,859, a decrease as compared with the corresponding week of last year of 115,556 and an increase as compared with 1922 of 77,001 cars. As in the preceding week the Southwestern was the only district that showed a gain as compared with the corresponding week of last year. Loadings of all commodities were lighter than a year ago. The summary as compiled by the Car Service Division of the American Railway Association is as follows:

REVENUE FREIGHT CAR LOADING Week Ended July 26, 1924

Districts	1924	1923	1922
Eastern	217,736	249,869	196,801
Allegheny	187,767	226,816	176,897
Pocahontas	41,839	44,640	25,572
Southern	127,681	133,299	113,246
Northwestern	138,882	172,689	150,843
Central Western	145,788	150,365	130,000
Southwestern	66,166	63,737	55,499
Commodities			
Grain and Grain Products	49,961	53,157	58,646
Live Stock	27,245	31,310	26,668
Coal	146,057	194,816	76,295
Coke	7,076	14,265	9,087
Forest Products	65,675	77,815	57,617
Ore	54,523	83,633	64,872
Mdse., l. c. l.	238,370	240,135	233,124
Miscellaneous	336,952	346,284	322,549
Total	925,859	1,041,415	848,858
July 19	930,284	1,029,429	845,548
July 12	910,415	1,019,809	850,676
July 5	759,942	850,082	707,025
June 28	908,355	1,021,471	862,845
Cumulative total, Jan. 1 to date.	26,713,207	27,946,237	23,272,374

The freight car surplus for the week ended July 22 was 344,892, a decrease of 10,828 cars as compared with the week before. This included 158,606 coal cars and 146,892 box cars.

For the Canadian roads the surplus was 28,050, including 24,150 box cars and 600 coal cars.

Equipment Repair Situation

Freight cars in need of repair on July 15 totaled 200,152 or 8.8 per cent of the number on line, according to reports filed today by the carriers with the Car Service Division of the American Railway Association.

This was an increase of 5,283 over the number reported on July 1 at which time there were 194,869 or 8.5 per cent.

Of the total number, freight cars in need of heavy repair

totaled 151,228 or 6.7 per cent, an increase of 6,316 compared with the number on July 1st. Reports showed 48,924 or 2.1 per cent in need of light repair, a decrease since July 1 of 1,033.

Class I railroads on July 15 had 11,772 locomotives in need of repair, 18.3 per cent of the number on line, according to reports filed today by the carriers with the Car Service Division of the American Railway Association.

This was an increase of 738 locomotives over the number in need of repair on July 1 at which time there were 11,034 or 17.1 per cent.

Of the total number, 6,428 or 10 per cent were in need of classified repairs, an increase compared with July 1 of 393 while 5,344 or 8.3 per cent were in need of running repairs, an increase of 345 compared with the first of the month.

Class I railroads on July 15 had 7,141 serviceable locomotives in storage. This was an increase of 24 over the number in storage on July 1 and the largest number of serviceable locomotives in storage at any one time since May, 1922.

During the first 15 days in July, 23,488 locomotives were repaired and turned out of the shops compared with 25,791 during the last half of June.

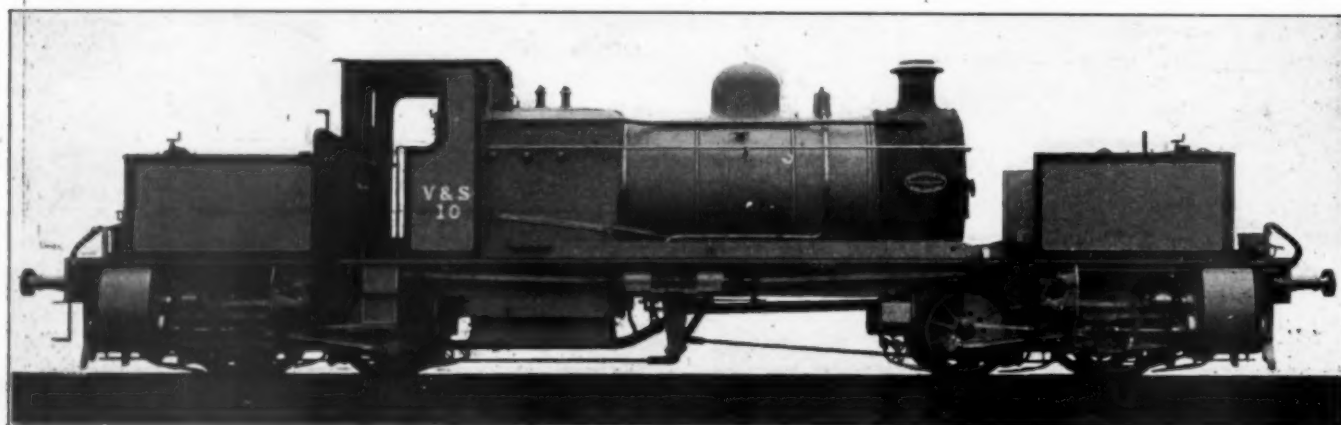
Car Loading in Canada

Revenue car loadings in Canada for the week ended July 26 showed a falling off from the previous week of 1,947 cars. The loadings for the week totaled 49,696 cars, the decrease in eastern Canada being 915 cars, and in the west, 1,032 cars. As compared with the same week last year loadings showed a decrease of 1,670 cars, of which 947 cars were in the east and 721 in the west. The cumulative totals up to July 26 are 1,604,966 cars, a betterment of 114,939 cars compared with the corresponding period in 1923.

Car loadings by commodities, for the week ended July 26 and for the previous week this year are as follows, respectively:

TOTAL FOR CANADA

Commodity	For the week ended	
	July 19 1924	July 26 Cars
Grain and grain products	4,944	4,311
Live stock	1,974	2,112
Coal	4,798	5,022
Coke	204	176
Lumber	4,059	3,547
Pulpwood	1,871	2,059
Pulp and paper	1,681	1,765
Other forest products	2,406	2,199
Ore	1,483	1,485
Merchandise L.C.L.	15,416	15,016
Miscellaneous	12,807	12,004
Total cars loaded	51,643	49,696
Total cars received from connections	27,561	31,317
Total cars loaded for corresponding week, 1923 ..	51,077	51,366



First Garratt Locomotive for Service in Great Britain

Built by Beyer, Peacock & Co., for Vivian & Sons, Hafod Copper Works, Swansea. Weight 137,700 lb.; tractive force, 27,900 lb.; total wheel base, 32 ft. 2 in.; four-cylinders, 13½ in. by 20 in.; driving wheels, 40 in.; heating surface, 1406 sq. ft.; grate area, 22.7 sq. ft.; boiler pressure, 180 lb. Tanks hold 1,800 U. S. gallons of water and 1½ tons of coal.

Danger of Too Much Talk About Co-operation*

Those Who Think Only of Their Own Selfish Interests
Would Clarify Issue by Admitting It

By Hayes Robbins

A STATESMAN of the greenback era, speaking of the proposals to resume payments in coin of the realm, advised that "the way to resume is to resume." According to some authorities—perhaps the Quakers—the way to have a friend is to be one.

It is time for someone to remind us that the way to co-operate is to co-operate. We are obliged to talk about co-operation, but it is exactly one of the things that will not stand too much talk. It will not stand any talk at all unless we are prepared to back up with deeds just what we say in words.

No Advantage in Professing Co-operative

Spirit and Not Practising It

Men who do not actually have the spirit and intent of the square deal in their relations with each other might far better say nothing about co-operation. The supervisor or the committeeman who actually believes and acts on the belief that the only way to get along under conditions as they are, or as he thinks they are, is to "play poker," trust nobody, and protect his personal status or policies at all hazards, at least commands a certain kind of respect for consistency. We know where to find him and are governed accordingly, but as a preacher of co-operation he can bring that good cause into a disrepute much harder to overcome than if he had frankly defended his practice or said nothing at all.

It is not to be inferred, of course, that he is the prevailing type. Our industrial system would have gone to pieces long ago if the majority of men did not believe in the square deal and try to apply it, at least to the extent of their knowledge and understanding. But we are in some danger, with all the recent programs of "personnel work" and "education" of getting our attention too far away from the root of the matter. It is the same danger that proved real and serious some years ago in the heyday of enthusiasm for "welfare work" and various paternalistic enterprises which many employers found were not appreciated, and became embittered and discouraged accordingly. Many of these attempts brought material improvement in the physical and sanitary surroundings of work, but for the most part they were based on a shallow understanding of human nature. The question constantly arose whether these expensive features were genuine, or were expected to draw attention from larger grievances still more expensive to rectify. Some of them were not, but unfortunately some were. Only those which were rooted in the soil of reasonable and honest dealing in the basic employment relations ever bore fruit in a real spirit of co-operation. Employers of broad-gage understanding have long since realized this.

Achievement of Co-operation Must

Await Will to Co-operate

Sooner or later we shall have to apply the same test to every form of labor relations—to profit sharing, to stock ownership, bonus plans, group insurance, pensions, mutual benefit associations, employee representation, adjustment and arbitration boards and "personnel" departments. Every one of these undertakings is based on the need of better co-operation and intended to help bring it about. Some of them may

be well adapted to one set of conditions, some to another—some are of proved, and others of doubtful value under any conditions. It is not so important to compare their technical merits as it is to see them for exactly what they are and what they are not. No beneficial scheme in itself, no matter of dollars and cents alone, can produce the will to co-operate. There may be fairer methods of payment for service as between individuals than those in common use, but no scheme can be devised to keep any one necessary factor, labor or capital or management, permanently at work for less than its normal economic earning power, nor to pay all of them more than a property can be made to earn. Men will work together to make it earn the maximum only as they can see it as a common opportunity, and are ready to give as well as to get their due.

A "Ten-Story Structure on a Two-Story Foundation"

The aim underlying so-called "personnel" work is at heart sound—it is one of the hopeful things in the making, having an eye to the future course of industrial events in this country. All the more important, therefore, that we have no "ten-story structures on two-story foundations." The moment when a big constructive idea at last gets its hold on public attention is usually also the moment when clear-headed common sense is most needed. A multitude of counsels and schemes crops up around it, and so much machinery is set up to put it into effect that the main essentials may almost be lost to sight. The very words and phrases of the new movement become hackneyed, and lose force accordingly. Everybody with a theory on the subject demands a hearing, not omitting the camp followers who attempt to commercialize it as a new opportunity to sell something to people assumed to stand in need of expert advice. We are accordingly flooded at such times with "educational" literature, some of it meritorious in itself, but very generally looked upon as propaganda and to that extent producing an effect the opposite of that anticipated.

If Absolute Frankness Is Dangerous,

Is Any Other Course Safe?

The day has gone by for anything except straight-forward dealing, direct exchange of views and of adequate information between managements and men, based on frank recognition that one may stand as much in need of it as the other. If such a program is "risky," are we to assume that anything less is "safe" for either labor or employer during the next twenty-five years?

Co-operation Not Built on Fear

An eminent jurist holds the view that one of the most marked of the changes observed during the period of his lifetime has been the growth of fear. Some of our timidity is no doubt due to inability to grasp the meaning of sudden and tremendous changes, some of it to alarmist journalism, and political irresponsibility. Some of it may be manufactured expressly to create a market for various brands of "security." But we can never build up real co-operation on fear. The first requisite is confidence, and there is no confidence without sincerity and courage.

The writer does not attempt to analyze different types of

* A paper submitted in the Railway Age's Contest on Co-operation.

personnel work, because it is not upon differences in machinery that success or failure of co-operation for efficiency depends. There is room for all of them which help bring to light the real sources of distrust and lack of interest, so that the underlying desire of the great majority of employees and of operating officials to work together in good spirit, with a sense of common interest, may not be blocked by conditions overlooked, or by the prejudices and methods of misplaced individuals. There is room for no personnel system which, however unintentionally, serves to conceal the one condition or perpetuate the other.

Personnel Department Should Not

Intervene Between Employee and His Superior

From this point of view, the recent strong drift to make personnel work advisory rather than administrative is in the right direction. There was, and is, a real danger in taking away from supervisory officials any of the functions of employment and direct relationship with the rank and file. The actual working relation is always between the man who directs and the man who executes, under any scheme of industry. Whatever co-operation we are going to have must be built into that day-by-day relation existing between the two. We shall not get it through any new machinery, however well it looks on paper, which may have the subtle effect of allowing the supervisor to feel that his sole job is to "run the road" while somebody else looks after the good relations. We shall never develop the full-size, all-round official nor the efficient employee on that plan. To divide responsibility for a square deal in employment, in discipline, in application of rules, in instruction and leadership, is the kind of temporary relief that makes the real disease incurable.

There is much, it is true, in the general problem of human relationship in industry and its actual working out all down the line with which the supervisory official, handling the immediate necessities of each day, perhaps cannot keep in touch. Here is where men with time and opportunity to study the situation in the large properly come into the field, alongside both supervisor and workman, but never in between. In that relation they may be of positive help and, in turn, their own ideas and plans will have the benefit of a constant check-up with the special experience and knowledge of both the executive and the employee.

Co-operation Does Not Mean "Glad Hand,"

Lax Discipline or Sentiment

There are many things which they can initiate in the way of interchange of information, suggestions and criticisms, to the end of clearing up misunderstanding. They will find opportunities to bring supervision into closer relation with the men on the line or in the shops, in more comprehensive respects than the give-and-take of orders. Particularly they will have opportunities, from a different angle than that of the supervisor himself, to locate the spots where a right general policy may be failing through wrong or misunderstood local application. They can do much to make the distinction clear that co-operation on either side does not consist in sentiment or talk or the "glad hand," nor in lax discipline, nor in right-and-left concessions burdensome to the industry and to the public, but in frankness, in putting reasonableness ahead of technicalities and permanent effects ahead of immediate advantage, in working for just and proper results instead of to make a record, in prompt investigation and decision, readiness to accept responsibility, honest effort to know the other side of the story, honest effort to see the common interest in building up business through the good service which comes of efficient operation.

But all work of this nature can best advance genuine co-operation as a co-operating factor itself, not as a substitute for any executive function. Whether it is purely individual, or handled through personnel departments, may

not particularly matter, so long as it does not get in between, or divide the responsibility for a high morale, or profess more than it is able to practice. The kind of co-operation necessary to real efficiency must build from the ground up.

Collision at Sharon, Vermont

THE NEW THROUGH PASSENGER TRAIN from Washington, D. C., to Montreal, P. Q., "The Montrealer," was involved in a collision in the first week of its life, resulting in the death of its fireman and the injury of seven passengers, five employees and one Pullman porter. This collision occurred on the Central Vermont, near Sharon, Vt., on June 20, about 3:20 a. m., and was caused by three men going to sleep on the locomotive of a freight train; and by their lack of intelligence or courage in neglecting ordinary precautions after they had awakened.

The Bureau of Safety of the Interstate Commerce Commission has investigated the collision and finds as above.

The passenger train was No. 21, consisting of nine steel cars hauled by C. N. R. locomotive 5079. A southbound freight train, having to meet No. 21, entered the passing track at Sharon at 2:55 a. m., 18 minutes before the passenger train was due. After brief conversation about meeting train No. 17, following No. 21, the engineman and the fireman and the head brakeman all went to sleep, the brakeman being on the running board. On awaking, Engineman Toof was of the impression that he had been awakened by the noise of train No. 21, passing his engine; and he remarked to the others that it had passed; and he says that the fireman agreed with him, and said he had heard the train. Engineman Toof then looked at his time-table to see where he could go for train No. 17; and, after some discussion, in which he said the head brakeman joined, it was decided to go to West Hartford. Engineman Toof was not positive about whistling off brakes; but he turned on the headlight and began to work steam, while the head brakeman went ahead to open the switch, this being at about 3:21 a. m. The train had not traveled more than about 500 ft. before the passenger train was met. Engineman Toof was unable to explain what it was that awakened him while on the passing track. It appeared that Toof had not had any sleep for about 19½ hours, although he had been on duty less than nine hours.

Fireman Tuttle claimed that he had not been fully asleep and that on awakening he thought he heard train No. 21; but, looking north and seeing nothing, he decided that the train had passed around the curve. He noted that the train was overdue and this fact appears to have been an element in the engineman's opinion or impression that he had been awakened by No. 21 and that the train had actually passed. Brakeman Sullivan admitted that he had been sound asleep, but said that in going to the switch he was acting entirely on the assumption that the engineman knew what he was about.

Conductor Allen, at the rear of the freight train, was working at his desk all the time the train was on the passing track; and when it began to move slowly ahead, he concluded that the engineman had heard No. 21 and was moving forward so as to be close to the switch. The conductor, on being informed by the flagman that No. 21 was coming, was so stunned by the information that it was some seconds before he started for the conductor's valve; and when he got to the valve it was too late.

It is apparent, says the report, in its conclusion, that the men on the freight had not forgotten No. 21; but no reasonable explanation was advanced concerning their actions from the time the train stopped on the passing track; nor was it determined what awakened the engineman and fireman and caused them to think train No. 21 had passed.

All of these employees were experienced men.



Interior of Turbine Room. One of the Two Turbines Is Shown in the Foreground.

A Model Oil-Burning Railroad Power Plant

M. K. & T. Plant at Parsons, Kan., Shows Monthly Saving of from \$5,000 to \$9,000

THE MISSOURI, KANSAS & TEXAS has built and placed in operation a power plant at Parsons, Kan., which is modern in every respect and which contains many features not to be found in the average railroad power plant. The plant provides steam, air and electric power for the railroad terminal and the present cost of generating the steam, electric power and of compressing air as compared with the cost of doing the same in the old plant shows a monthly saving which varies from \$5,000 to \$9,000.

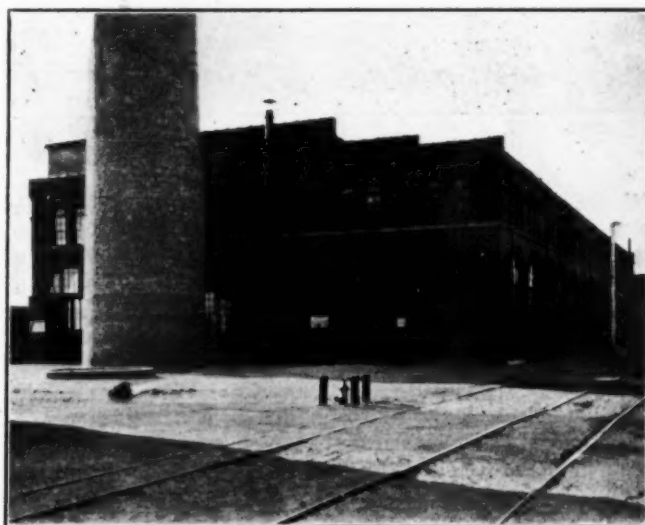
Electric power is developed by two bleeder type turbine generator sets. A turbine driven rotary air compressor and a synchronous motor driven air compressor make it possible to obtain a good heat balance and corresponding high efficiency for both day and night loads. All water, oil, air, steam and electric power which is used in the plant or which passes through the plant is measured. The metering apparatus used consists essentially of eighteen recording integrating and indicating flowmeters and a number of watt-hour meters on the switchboards. Exhaust steam is used for heating and for operating the rotary air compressor.

Boiler Room

The boiler room equipment consists principally of five, 516-hp. Babcock & Wilcox Sterling type, oil fired boilers designed for 200-lb. steam pressure. One hundred deg. of superheat is maintained with Elesco superheaters. At present, under normal conditions, two of the boilers operating at 165 per cent rating are in service at one time.

The boilers have back shot type Peabody burners and

draft is provided by a Custodia radial brick stack 200 ft. high and 10 ft. in diameter. Exhaust steam is used to heat the



Exterior View of the Power House

fuel oil and keep it fluid. Oil pressure to the burners is maintained by automatic reciprocating pumps. The feed-water temperature is kept at a temperature of approximately

216 deg. F. by a Cochran feedwater heater with a measuring and wiring device. Water so treated as to practically eliminate scale formation is used as feedwater. It is pumped into the boilers by two Worthington steam driven, 12-in. by 7½-in. by 15-in. duplex pumps. The pumps are controlled by a Copes automatic water regulator.

On each boiler front, where the fireman can see them are indicating gages showing steam pressure, boiler horsepower and draft. Each boiler is also equipped with individual CO₂ machines and thermo-couple recording and indicating pyrometers of the smoke chart type.

Power Machinery

The machinery in the main turbine room consists of two 1,000-kw. turbine driven generators, one 600-kw. and one 240-kw. motor generator sets, a motor driven air compressor, a turbine driven air compressor, a steam driven air compressor



The Five Oil Fired Boilers

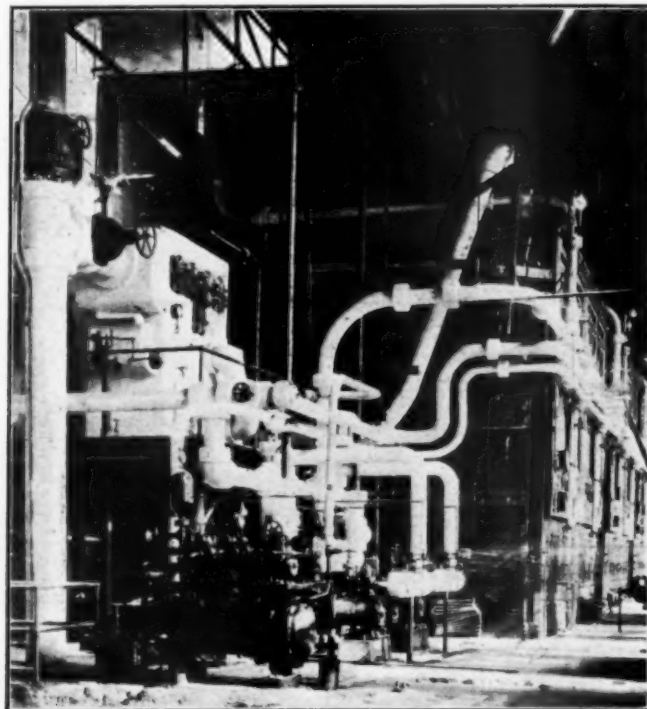
and two turbine driven fire pumps. In addition to the machinery, there is an alternating current switchboard, a direct current switchboard, a flowmeter board and a wall panel on which a number of gages are mounted. This panel contains gages showing feedwater pressure, air pressure, exhaust pressure or vacuum, water pressure, boiler steam pressure, water suction or city water pressure and a clock protected from possible damage by stray magnetic fields. Two smaller panels mounted on the wall opposite each of the turbo generator sets have gages showing steam pressure, vacuum and speed in r.p.m.

Turbine Generators

Exhaust steam is used for heating, high pressure steam for blowing engines, compressed air for operating air tools, etc., and electric power is used for driving machines and lighting the back shop, car shop, enginehouse, foundry, reclamation plant, passenger station, general storehouse, fuel department building, ice plant, laboratories, railroad Y. M. C. A.

office building, record building, and for all yard lighting and yard and crossing signals.

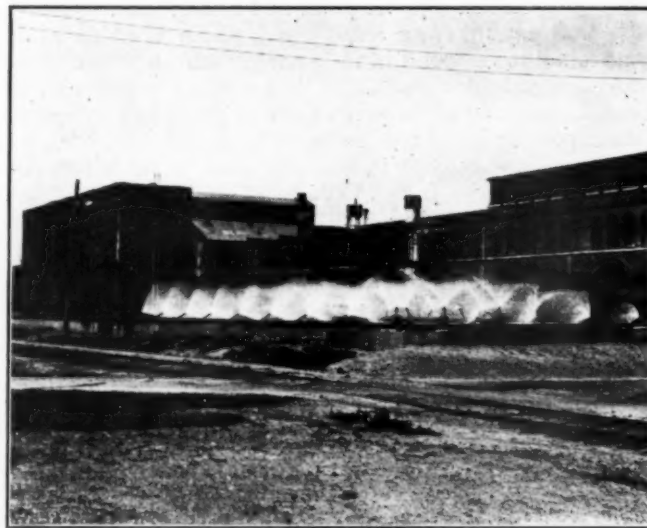
All electric power is developed by two 1,000-kw. Curtis turbine generator sets running at 3,600 r.p.m. The turbines are 3-stage bleeder type turbines designed to operate on steam at 175 lb. pressure and 100 deg. superheat. Each



Feedwater Heater, Boiler Feed Pumps and Oil Pumps

turbine is directly connected to a 1,000-kw. General Electric 60-cycle, 2,300-volt alternating current generator. The exciter which is mounted on the generator shaft consists of a 16-kw., 125-bolt direct current generator.

A single Schutte & Koerting jet condenser is used in con-



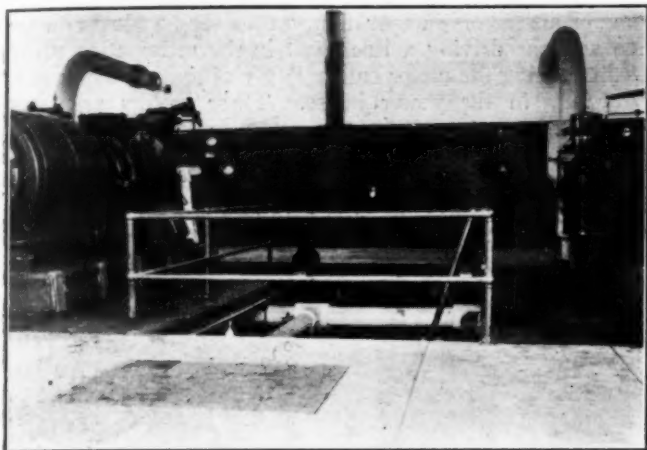
The Spray Pond

junction with either or both of the turbines. It is unique in that it has no air exhaust pump; the air being carried out of the condenser by ejector action of the cooling water. Only one of the turbines is used at a time, but should it be necessary to use both, the condenser can be made to take care of both

by changing the size of the jet or spray head. Four Cameron turbine driven volute pumps are available for pumping condenser water. Two of these are used at a time; one for pumping cold water into the condenser and the other for pumping the condenser exhaust water from the hot well to the spray pond.

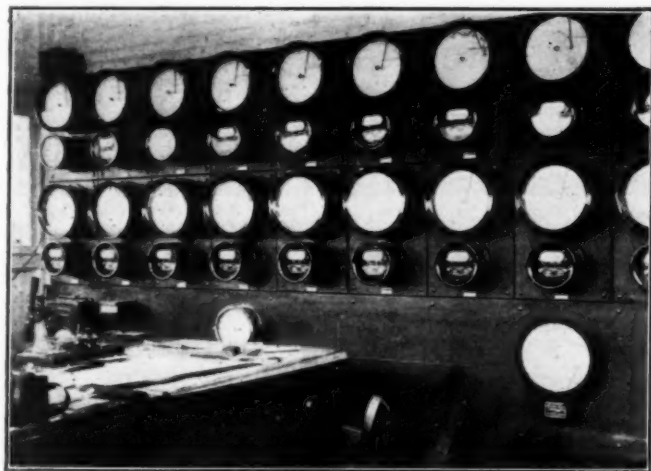
Air Compressors and Fire Pumps

The plant is equipped with three air compressors. One of these is an Ingersoll-Rand rotary compressor of 3,600



Condenser in Pit Located Between the Two Turbine Generator Sets

cu. ft. capacity driven by a mixed pressure steam turbine. The machines run at from 6,000 to 6,600 r.p.m. The turbine operates ordinarily on steam at 5 lb. pressure taken from the bleeder type main turbine at a point between stages but can when necessary be supplied with high pressure steam. A vacuum of 27 in. mercury is maintained on the compressor



The Flowmeter Installation

turbine by a separate condenser. The compressor delivers air to the air lines at 100 lb. pressure.

The second air compressor is an Ingersoll-Rand two stage class P. R. E. 2 reciprocating air compressor with air cylinders 20½ in. by 24 in. and 33 in. by 24 in. respectively. It is driven by a General Electric type A. T. I. 680-hp., 164 r.p.m., 2,300-volt synchronous motor.

The third compressor is an Ingersoll-Rand, two-stage, tandem compound steam driven air compressor. This machine operates on steam at boiler pressure and is somewhat smaller in capacity than the motor driven compressor.

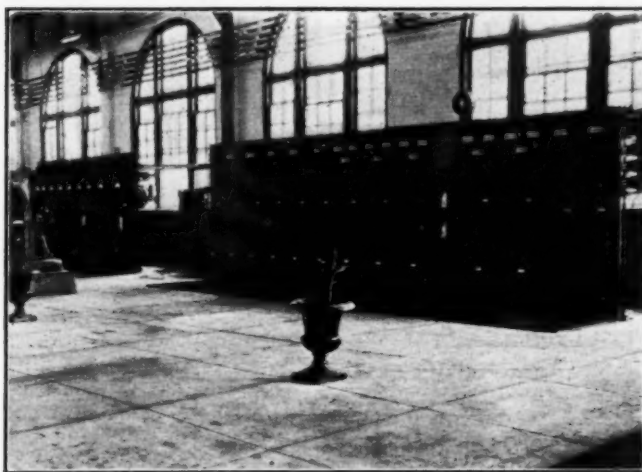
Two fire pumps are installed in the plant. They are

Worthington size 6-CL-BS centrifugal pumps each driven by a Curtis 100-hp. non-condensing steam turbine running at 2,200 r.p.m. on 175 lb. boiler pressure steam. One of these pumps runs constantly holding pressure on the fire line at from 85 to 90 lb. This pressure can be raised when wanted to 120 lb. The turbines which drive the fire pumps are identical and interchangeable with those used to drive the pumps on the main turbine condenser.

Flowmeters

The flowmeter installation is probably the most unusual feature of the plant. It is located in the built-in office in the turbine room and consists of 18 Republic recording and integrating flowmeters and 3 Bristol recording gages.

Five of the flowmeters are connected to the headers of the five boilers. They record the rate at which steam is being delivered by the boiler at any time and also show the total amount of steam delivered by the boiler. The remainder of the flowmeters are used as follows: one on each of the two turbines; one on feed pumps and auxiliaries; one on high pressure steam line to turbine air compressor; one on low pressure line to turbine air compressor; one on water delivery of fire pumps; one on shop high pressure steam line; one on



Alternating Current Switchboard on the Right and Direct Current Switchboard on the Left

shop low pressure steam line; one on back shop air line; one on yard air line; one on roundhouse and old shop air line; one on roundhouse steam line.

The Bristol gages record temperature of superheated steam, draft and boiler pressure.

Motor-Generators

Alternating current is used for lighting and for the operation of the motors in the shops. Crane motors and variable speed motors are operated on direct current and this direct current is developed by two motor generator sets which receive alternating current power from the turbine generators.

The two sets are not the same size. The larger set consists of a General Electric, type ATI, 2,300-volt, 850-hp., 900 r.p.m., synchronous motor driving a type M. P. C. 250-volt, 600-kw. direct current generator. The smaller set is similar to the larger one except that the motor is rated at 350 hp. and the generator at 240 kw.

Switchboards

There are two switchboards, one for controlling all alternating current circuits and the other for direct current circuits. At one end of the a. c. switchboard is a bracket panel on which are mounted two a. c. voltmeters, one d. c. voltmeter and a synchronism indicator. By means of plug

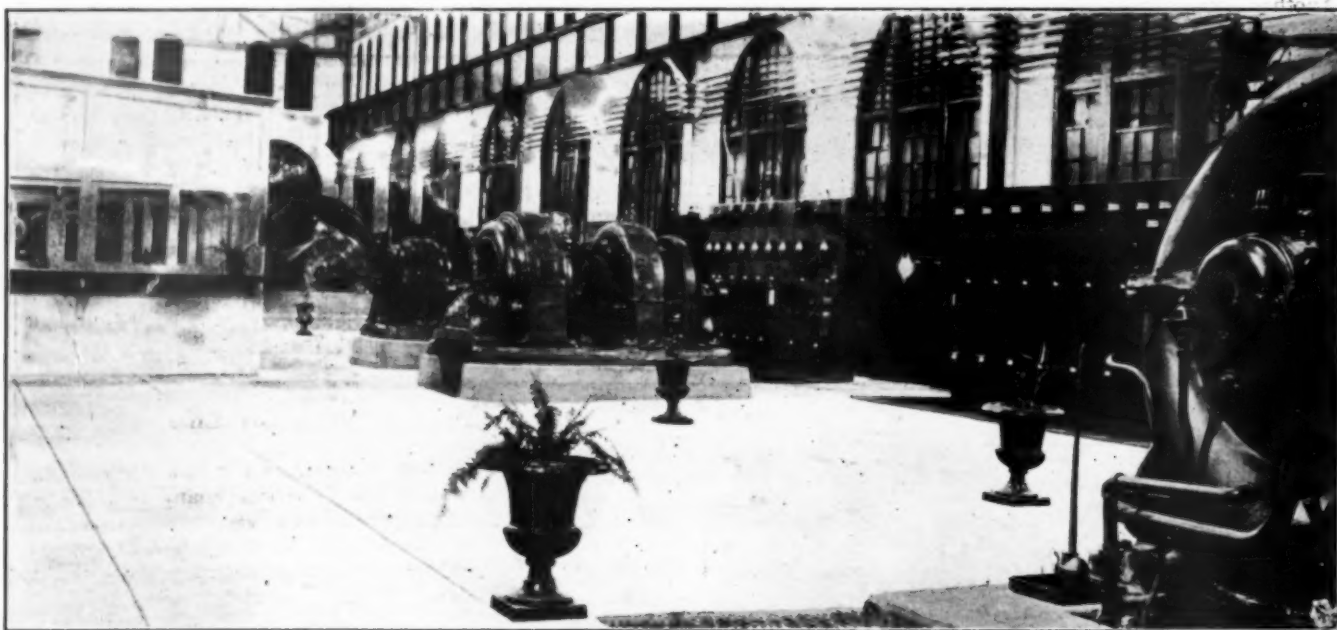
switches these instruments are made to serve both of the main turbine generators. The switchboard proper consists of 13 panels. From right to left as shown they are used to control circuits as follows: (1) two main generator exciters; (2) No. 1 turbo-generator; (3) No. 2 turbo-generator; (4) voltage regulator (this panel is also fitted with curve drawing instruments showing power factor and kw. output of main generators); (5) 850-hp. motor of No. 1 motor generator set; (6) 350-hp. motor of No. 2 motor generator set; (7) air compressor motor; (8) rivet heater circuit; (9) reclamation plant; (10) passenger and freight depots; (11) old shops; (12) shop lights; (13) yard lights. All panels except No. 4 are equipped with indicating ammeters and all panels except Nos. 1 and 4 have integrating watt-hour meters. This means that all outgoing power and all generated power is measured. Each circuit is protected by oil switches with automatic release and inverse time limit overload relays. The yard lighting panel controls the primary of two series lighting transformers. The two small series lighting panels are located between the two main switchboards.

The direct current switchboard is made up of 8 panels

R. L. M. type reflectors hung from the ceiling above the crane, 7 elliptical or angle reflectors on each end wall. Each reflector is fitted with a 300-watt type of C lamp. Two switches control the ceiling lights and four control the lights on the side walls.

Power Factor

Power factor is kept practically at unity throughout the entire 24 hours of the day in spite of the fact that there are a large number of induction motors in the shops which tend to reduce the power factor. During the day there are three synchronous motors in operation, one driving a blower in the shop and one driving a line shaft in the reclamation plant, the third being the motor on the larger of the two motor generator sets in the power house. These motors are over-excited and effectually hold the power factor close to unity. At night the synchronous motors in the shop and reclamation plants are shut down while the smaller motor generator set is big enough to carry the d. c. load and is therefore used in the place of the larger one. This reduction of synchronous motors in service is offset, however, by substituting the



The Turbine Room at Night

controlling circuits as follows: (1) 600-kw. generator of No. 1 motor generator set; (2) 240-kw. generator of No. 2 motor generator set; (3) curve drawing wattmeter and d. c. voltmeter; (4) old shop power; (5) locomotive shop power; (6) blacksmith shop power; (7) cranes; (8) shop office building and truck battery charging set. Both generators are protected by circuit breakers equipped with overload and undervoltage relays. All outgoing circuits are protected by overload circuit breakers and the power in generator circuits and all outgoing circuits is measured by integrating watt-hour meters.

Interior Finish and Lighting

The main turbine room, 208 ft. long and 44 ft. wide, presents an unusually attractive appearance. The lower 8 ft. of the inside walls is faced with brown tiled brick. Windows and door frames are painted black and all steelwork battleship gray. The walls and ceilings are white. The floors are concrete painted a blue slate color. All the machinery is dark green, gold trimmed. The entire turbine room is served by a Whiting, 15-ton crane.

The turbine room is lighted at night by 7 Benjamin

synchronous motor driven air compressor for the turbine driven compressor.

Heat Balance

During the day time hours of operation steam is taken from the boilers at 200 lb. pressure and 100 deg. superheat to one of the main turbines which is a bleeder or extractor type turbine. Enough steam is taken from a point between the first and second stage of the turbine at a pressure of 5 lb. to operate the turbine driving the rotary air compressor, to supply steam for the heating system and to heat feedwater.

The electrical load on the turbine driven generator is sufficiently high during the day to warrant good efficiency and there is enough low pressure steam for the rotary compressor. The turbine efficiency in kilowatt hours per pound of steam is of course not as high as it might be as low pressure steam is extracted ahead of the second stage. Overall efficiency, however, is very good. The turbine uses 21 lb. of steam per kw. hr. while extracting and about 15 lb. when not extracting.

During the night the shop a. c. load is light and the small motor generator set is large enough to provide of the d. c. power requirements. Such a reduction of load on the main

turbine generator would reduce its efficiency but by substituting the motor driven air compressor for the rotary compressor, the load on the main generator is kept up and efficient operation maintained.

Savings

The boilers in the plant evaporate 14.21 lb. of water per pound of oil and cost of generating electric power is estimated at less than one cent per kilowatt hour. Power demands on the plant have been approximately constant but fuel costs have been reduced more than \$5,000 per month.

The cost of developing the necessary power with the old plant which was displaced by the new one was about \$13,000 per month. In January, 1923, it was \$13,048.25; in February it was \$14,234.82 and in March it was \$15,792.17. During the corresponding months of 1924, the cost of power as developed by the new plant was \$8,190.60, \$6,219.00 and \$6,575.90 respectively. Maintenance costs have been similarly reduced.

More efficient machinery is in part responsible for the savings effected. Power was generated in the old plant with non-condensing, reciprocating steam engines direct connected to electric generators.

Another important factor in effecting savings was the introduction of proper specifications and methods of testing fuel oil. Fuel oil having a specific gravity of 24.5 is insisted on and the oil is tested periodically to see that the quality is uniform and that it does not contain water or free carbon. The average cost of oil is 91 cents per barrel.

Labor costs have also been reduced as the old plant required four more men than are needed in the new plant. At present the total force for the three shifts is 16 men.

Flowmeters Disclose Waste

The flowmeters have disclosed wastes, particularly in the air lines. They have also shown that certain departments were not charged correctly for air, water and steam. The shop was previously charged with 59 per cent of the air compressing costs while 41 per cent was charged to the roundhouse and yards. The flowmeters disclosed the fact that the actual conditions were reversed; the shop using 39 per cent of the air.

The amount of oil used for lubrication has been reduced from 29 barrels to 3 barrels per month. For the most part this reduction is effected by machinery having bearings which use the oil efficiently and do not waste it. A part of it is accomplished by a water filter. After the oil in the turbine bearings has been used a certain length of time it is removed and run through the filter. The filtered oil makes a high grade lubricant for lathes, motors, line shafts, etc., in the shop and it is used for this purpose, the power plant being given credit for oil used in this way.

Additional fuel and labor savings will be effected as soon as three 250-hp. boilers now operating in the roundhouse can be shut down and steam piped from the new plant. A fuel saving of approximately \$4,000 per month and a saving in operating costs of \$500 per month will be made by this change.

The plant was designed by M. C. M. Hatch, general mechanical superintendent and C. C. Chase, power plant superintendent, and was installed by Mr. Chase with railroad forces.

SAFE PRACTICE PAMPHLET No. 61, recently published by the National Safety Council, deals with mechanical refrigeration, describing the properties of refrigerating materials and types of equipment used, and discussing the hazards involved. Information is given on the compression system; the absorption system; characteristics of various refrigerants; location and building construction; prevention of explosions, etc.

The C. N. R. Office Method Service

By C. U. Stapleton

Supervisor of Office Methods, Canadian National Railways

THE MANAGEMENT of the Canadian National, for some time past, has recognized the necessity of a more systematic study and analysis, of office methods and office material, to permit greater interchangeability of both staff and equipment, as well as to encourage staff reduction without impairing record-keeping results.

Apart from the obvious benefit of uniformity of practice, it was felt, because railway work is normally conducted under pressure, that it is unusual for experienced members of an office to realize that they should take the time to analyze the office operations closely in order to relieve congestion. So the rule is for congestion to be attributed to lack of staff, and for application to be made for additional staff to take care of the situation.

As a rule, on most railways, few office employees (unless obviously incompetent) are dropped from the payroll except on instructions from the management for a general staff reduction. This tendency to increase, and not to cull the staff, brings the natural result that clerical production is not given the consideration it deserves. While the same advance has not been made in time and motion studies for office work, as in the shop, yet Canadian National officers who have given the matter study, consider that railway office production can be substantially increased by better methods, and a large improvement made at a relatively low cost.

It has already been proved, in outside railway operations, that standardization lowers the cost of both labor and materials, and the brief experience of office method studies on the C. N. R. has demonstrated the value of this principle as applied to clerical operations.

Relation of Office and Line

It is admitted that any dragging inside has a tendency to slow up outside operations, and, because many decisions are made from detail assembled through office transactions, any revision of procedure, which will facilitate assembling this detail, results in speeding up action outside. This has the natural result of reducing delayed decisions, and delays admittedly are irritating to patrons and officers, as well as expensive. Therefore, the conclusion is reached that not only does it pay to increase office efficiency on account of the advantages which naturally accrue in the offices themselves, but that a very much greater advantage is obtained by the result of this, on the work of those not actually in the office, but affected by the decisions emanating therefrom.

Large corporations, especially those where concentration under one roof or in one locality is possible, have recognized the advantages of proper office organization—the railways have recognized it in many large specialized offices. Railway work, however, is at a disadvantage on account of the necessity of maintaining relatively small offices at very many points. It is to these outside points, where the work is subject to considerable seasonal fluctuation and where the office work does not lend itself to specialization, that the greatest attention is being given on the C. N. R.

Office methods service is now supplied by the management to fill the need that its name implies. The object of this service is to furnish workers, equipped by experience and training, to make a survey of any office, report on existing methods and makes recommendations by which savings may be effected. The plan of A. J. Hills, assistant to vice-president, who originated the movement in the C. N. R. organization, was to start with the executive offices and gradually

standardize the office activities, establishing uniform methods of handling such operations as were common to all offices. From this start, his plan was to work down through the general managers and general superintendents until the smaller offices were reached.

Filing

As an example of how this plan worked out in the operating department, it was found, on account of the different railway units amalgamated into one system, that various types of correspondence filing systems were in use, which resulted in a complexity of file numbers even among different offices in the same unit. This meant that one filing department could not take advantage of the analysis made by another filing department to determine the subject of a new file, because the writer's quoted file number bore no significance to the recipient of the letter, so that the subject had to be decided, over and over, until everyone concerned in the transaction had a covering file. In addition to this, of course, there was difficulty in being able to relieve file clerks during the vacation season, or when sickness occurred, and also the filing equipment, and filing supplies, lacked uniformity.

This is now being changed: A filing system especially suited to the operating department of this railway has been designed, which covers no more, and no less, than the subjects used by this department, from the vice-president's office down to the minor operating offices. The system is simple, the subjects are in alphabetical order and the numbers consecutive. The subject list being assembled in chart form is completely visible. Its use allows an office to dispense with the incoming and outgoing letter registers, which alone more than pays the cost of installation of the filing system.

Standard Equipment

As replacements occur, standardization is to be extended to office equipment, such as the material and design of furniture, the make and model of office appliances best suited to the different requirements, etc., which will increase the mobility of equipment and operators, and will enable the purchasing department to better forecast its office material commitments.

After a preliminary survey, it was decided that planning and layout were the first two essentials in this work. The planning consists of the routing of work in a continuous line through the office, without any back tracking, and the layout covers the shifting of desks and equipment to secure this result, by bringing those employees with interlocking work into close contact. This requires a careful observation of the details of the office routine and sometimes a separate study of each operation. It is necessary at the same time to sell the employee on the advantages to be gained by himself in increased ease of operation, and also in the better showing he will make by using a revised method.

Elimination of Delay

It is being found in some cases, that it is not always the methods that are at fault, so much as it is the delay between different steps in forwarding the transaction through to completion. In relation to delays it is the opinion of some of the C. N. R. officers that the growing volume of correspondence should be restricted to essentials. It is not only the cost of letter writing, which bulks very large as an item in railway expenses, but, what is of more importance, the cost entailed in retarding the completion of those transactions which might be decided in a few minutes over the telephones, or by personal interview.

We have found that various record keeping systems covering identical operations, and different types of office equipment with different layouts, create confusion in the minds of employees transferred from one office to another. This confusion is naturally dispelled when the employee becomes

familiar with his new environment, but this takes time, and is a source of considerable loss in large organizations similar to our own.

We occasionally notice in an office an employee who would like to revise the method of handling his work, but who hesitates to cast reflection on his senior in the office who taught him the work, and who may have had something to do with originating the procedure now in use.

Office Analysis

One of the greatest handicaps to office efficiency is that the chief clerk is expected not only to supervise and plan work for others, but to perform routine work as well. The neglect of his routine duties becomes immediately apparent, and therefore, demands his first attention. This relegates the supervising and planning to slack periods, as any neglect of this part of his work will show only when continued for a considerable length of time. On this account, we are endeavoring to have at least the ground work of study and planning done by workers qualified to undertake such duties as these.

The result of any investigation of existing office practice is always thoroughly analyzed, and discussed with those actually engaged in the routine operations, as well as with the chief clerk of the office. Comparison is made with data secured from many sources, not otherwise at the disposal of the office concerned. Recommendations are then submitted in concrete form, based on the above, and on the accumulated experiences of the office method worker regarding the best office practice. From this, the standard method to be recommended is set—this recommendation to stand until further study develops improvements which can be applied to advantage, owing to changed conditions such as an increased volume of transactions, etc.

Book of Standard Office Practice Proposed

Upon the establishment of a standardized set of methods, embracing one entire operation, a circular is issued to all other units of identical activity, and upon the completion of our present study to obtain uniformity in one department, it is our plan to have the circulars combined in a book of standard office practice. This will be in loose leaf form, of course, for revisions as necessity demands. We hope later to issue an office manual containing a brief history of our organization, general information regarding office rules, privileges, etc., advice and suggestions from the management, of a practical and inspirational nature, and other matter found profitable and instructive in manuals now being compiled by other large organizations.

The experience gained shows that it is quite possible to carry on such a service in the limited way necessary to test its self-supporting quality, without having recourse to an expensive department.

While this work is being conducted at present as an activity of the operating department by the writer on the staff of S. J. Hungerford, vice-president, it has been the policy to meet, as fully as possible, the requests of other departments for assistance, and the calls have been frequent showing that there is a general recognition of the value of such work in all departments.

THE GREAT LAKES SHIPPERS' REGIONAL ADVISORY BOARD is to hold its eighth regular meeting at the Board of Commerce, Detroit, Mich., on Tuesday, August 12. Among the subjects to be considered are economic factors of the railroad service situation; delay to refrigerator cars and formation of terminal committees; loading cars 10 per cent above their marked capacity, and consideration of Rule 86, M. C. B. Code; practice of some railroads in forcing the use of their own cars for foreign shipments when there is an available supply of foreign cars that could be used.

Railway Freight and Passenger Traffic Forecasts

An Analytical Survey of the Various Estimates Recently Made of Future Railroad Business

By L. A. Abbot

Statistical Analyst, Interstate Commerce Commission

RECENTLY there have been presented various predictions covering the prospective railway traffic (both ton-mileage and passenger-mileage) for the next 10, or even 20 years. Such forecasts, when carefully estimated, are of practical value, first, for the railroad companies which can use them in budgetary estimates for necessary expansion; second, for the manufacturers of railway equipment and supplies, who have to figure on required future production; and third, for the general public which is not only interested in

by Dr. W. M. Persons of Harvard University. These were not published at the time, but are now presented, and will be referred to as "Str. Line."

(2) A forecast of railway traffic volume for 1933, was published November 9, 1923, by a committee of the Chamber of Commerce of the United States. The report was entitled "Probable Freight and Passenger Traffic in the year 1933, Railways of the United States." The prediction it contained was defended by Dr. J. H. Parmelee (director of the

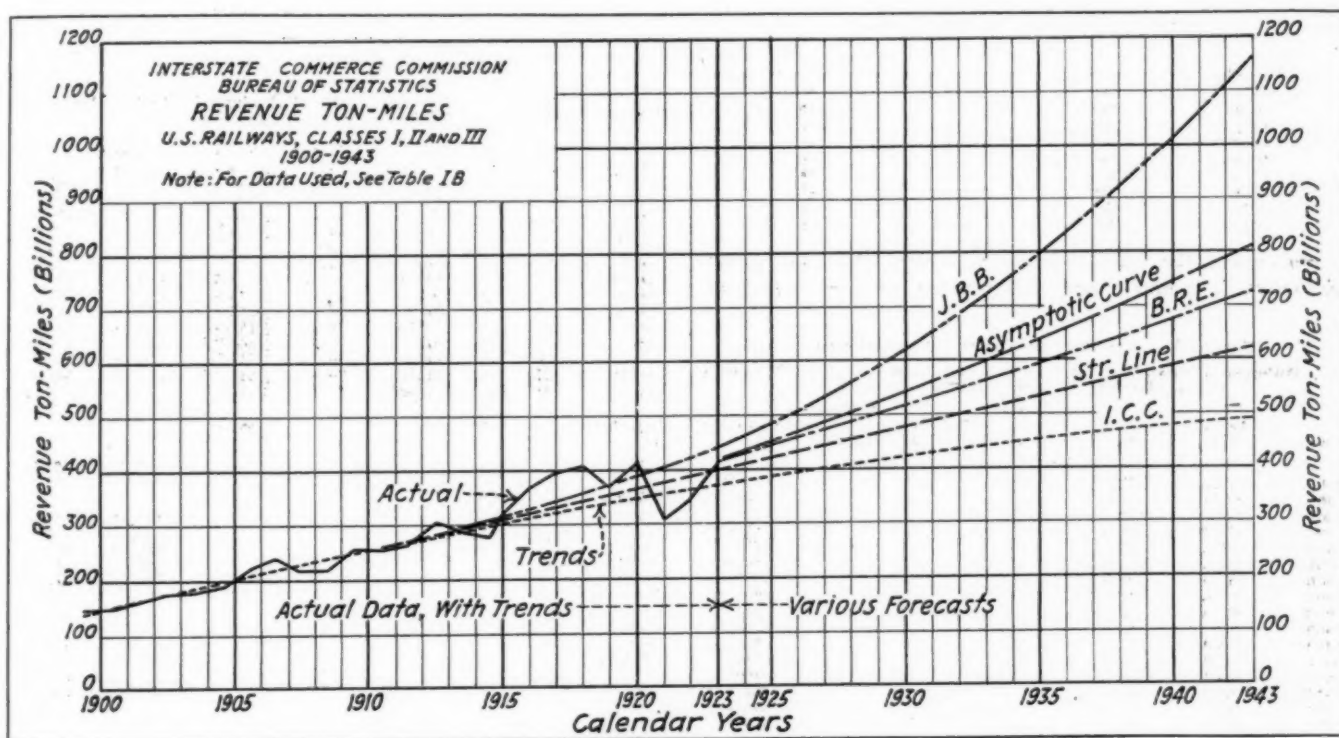


Fig. 1

the investment possibilities, but in the fact that the progressive traffic growth of the railroads has numerous economic consequences. The results obtained by the several methods differ so widely, that it seems worthwhile to make a critical and constructive survey of the various prognostications.

Forecasts in This Survey

(1) The Bureau of Statistics, Interstate Commerce Commission, in 1921, issued data and curves for ton-miles and passenger-miles from 1890 to 1921. These curves were projected from 1921 to 1930, the projection being based on the actual trend for the years 1900 to 1915, and ignoring the subsequent abnormal war and post-war periods. The curves were used in the opinion of the commission in "Reduced Rates, 1922" (68 I. C. C. 676, 701). They will be referred to later in tables and charts as "I. C. C."

(1A) In connection with the preceding study, the undersigned also developed, for comparative purposes, some straight-line trend forecast figures according to methods used

Bureau of Railway Economics, and a member of the committee above mentioned) in a letter published in the *Railway Age* of March 15, 1924. This forecast will be referred to as "B. R. E."

(3) J. B. Blood, a valuation analyst in the Interstate Commerce Commission, contributed an article in the *Railway Age* of February 9, 1924, entitled "Forecasting Future Volume of Railway Traffic," which discussed the trend of traffic from 1923 to 1943. This forecast will be later referred to as "J. B. B."

Each of the above forecasts was developed by a different method or formula. The first (1), and the collateral one (1A), are both based on the traffic data for the years 1900 to 1915 only. Both the second and the third are based on some theoretical relation between growth of railway traffic and growth of population; and they both take into account the abnormal data of the war period in making their deductions.

For purposes of comparison all forecasts to be discussed

will be extended to the year 1943, although a ten-year forecast would seem to go sufficiently far into the future for most practical purposes.

(1) The "I. C. C." Method

a. Technical description. After plotting the actual ton-mile data, the statistical method of "moving averages" was used to calculate and obtain a smooth trend through the years 1900 to 1915, and then the best curve to fit this smooth trend was derived mathematically, and extended by formula through the succeeding years. It was found that a logarithmic parabola having the formula, $y = a + bx + cx^2 + d \log x$ served the purpose best. From the data used the definite formula was

$$y = 135.368 + 12.09424x - .08833x^2 - .15856 \log x$$

where y = ton-miles in billions, and x = number of years after the year 1900.

b. Discussion of results. The I. C. C. trend results are given in Table 1B. A comparison of actual ton-miles, and ton-miles of this formula during the world war and post-war periods may be of interest.

REVENUE TON-MILES (BILLIONS)

Calendar years	Actual data	Curve results	Ratio =	
			Actual data	Curve results
			Per cent	
1916	366.2	310.7	118	
1917	398.3	319.8	125	
1918	408.8	328.7	124	
1919	367.2	337.4	109	
1920	413.7	346.0	120	
1921	309.5	354.4	87	
1922	342.2	362.6	94	
1923	417.1	370.6	113	

Considering the curve results as normal for the above eight years, it is noted that 1923 was not as good a year as

TABLE 1B. REVENUE TON-MILES, AND FORECASTS

U. S. Railways, Classes I, II and III. Comparison of Actual Data with Various Derived Amounts. (All in Billions.)

Years	Actual data	I. C. C. trend	Straight-line trend	Bur. of Ry. Econ.	Asymptotic curve formula	J. B. B. Valuation analyst
<i>Fiscal Years</i>						
1900	141.6	135.4	137.5	...	...	137.0
1901	147.1	147.4	148.6	...	...	146.1
1902	157.3	159.2	159.8	...	...	155.6
1903	173.2	170.8	170.9	...	...	155.6
1904	174.5	182.2	182.1	...	...	175.7
1905	186.5	193.5	193.2	...	...	186.4
1906	215.9	204.6	204.4	...	...	197.6
1907	236.6	215.6	215.5	...	...	209.1
1908	218.4	226.1	226.7	...	...	221.2
1909	218.8	236.9	237.8	...	...	233.6
1910	255.0	247.3	249.0	...	...	246.6
1911	253.8	257.6	260.1	...	...	258.5
1912	264.1	267.6	271.3	...	...	270.7
1913	301.7	277.5	282.4	...	...	283.4
1914	288.6	287.2	290.6	...	...	296.4
1915	277.1	296.7	304.7	...	...	309.9
<i>Calendar Years</i>						
1916	366.2	310.7	321.5	...	...	331.1
1917	398.3	319.8	333.6	...	...	345.5
1918	408.8	328.7	343.8	...	...	360.3
1919	367.2	337.4	354.9	...	...	375.5
1920	413.7	346.0	366.1	...	366.1	391.1
1921	309.5	354.4	377.2	...	380.6	406.5
1922	342.2	362.6	388.4	...	395.9	422.4
1923	417.1	370.6	399.5	420	411.7	438.6
<i>Forecasts</i>						
1930	...	422	478	519	542	622
1933	...	441	511	564	596	719
1940	...	480	589	676	742	1,009
1943	...	494	623	727	816	1,167

1916, 1917, 1918 or 1920, but better than 1919. According to this curve, 1923 ton-mileage should be considered 13 per cent above normal. The results forecasted by this curve are not impossible but may be considered conservative.

(1A) The Straight Line Method

This is a mathematical method of finding the straight-line which will fit closest to the series of actual points as plotted. This special method was developed and is utilized by the Harvard University Committee on Economic Research.

a. Technical description. The straight-line formula is $y = mx + b$, where y = ton-miles in billions, and x equals the number of years from 1907, the middle year of the ton-mile series of years 1900-1914 inclusive, as shown on Table 2B. In order to obtain "b," the average height of ordinates on the straight line at the central year 1907, the

equation $b = \frac{\sum y'}{n}$ was used, where y' are the ton-mile ordinates, and " n " = 15 (the number of years in series); $\frac{3233.08}{15}$ in this case, $b = 215.54$. The constant " m "

is derived by the equation, $m = \frac{\sum xy''}{\sum x^2} = \frac{3122.075}{280} = 11.15$. For further particulars see Table 2B. From the above the formula becomes $y = 11.15x + 215.54$, and the results are shown in Table 1B.

b. Discussion of results. This method is especially useful

TABLE 2B. REVENUE TON-MILES.
(By Straight-line Trend)

Years	x years from 1907	x ²	(y') Actual T.-miles (billions)	(y'') diff. y' and b	Product of xy''	Product mx	Ton miles derived=y (billions)
<i>Fiscal</i>							
1900	-7	49	141.6	-73.9	+517.6	-78.05	137.5
1901	-6	36	147.1	-68.5	+410.8	-66.90	148.6
1902	-5	25	157.3	-58.3	+291.3	-55.75	159.8
1903	-4	16	173.2	-42.3	+169.3	-44.60	170.9
1904	-3	9	174.5	-41.0	+123.1	-33.45	182.1
1905	-2	4	186.5	-29.1	+58.2	-22.30	193.2
1906	-1	1	215.9	+0.3	-0.3	-11.15	204.4
1907	0	0	236.6	0	0	0	215.5
1908	+1	1	218.4	+2.8	+2.8	+11.15	226.7
1909	+2	4	218.8	+3.3	+6.5	+22.30	237.8
1910	+3	9	255.0	+39.5	+118.4	+33.45	249.0
1911	+4	16	253.9	+38.2	+152.9	+44.60	260.1
1912	+5	25	264.1	+48.5	+242.7	+55.75	271.3
1913	+6	36	301.7	+86.2	+517.1	+66.90	282.4
1914	+7	49	288.6	+73.1	+511.7	+75.05	290.6
Sums	15	280	3,233.081	...	3,122.1	...	3,233.085
<i>Calendar</i>							
1915	8	...	...	...	...	89.20	304.7
1916	9	...	...	...	...	100.35	315.9
1917	10	...	...	...	...	111.50	327.1
1918	11	...	...	...	...	122.65	338.3
1919	12	...	...	...	...	133.80	349.5
1920	13	...	...	...	...	144.95	360.7
1921	14	...	...	...	...	156.10	371.9
1922	15	...	...	...	...	167.25	383.1
1923	16	...	...	...	...	178.40	394.3
1924	17	...	...	...	...	189.55	405.5
1925	18	...	...	...	...	200.70	416.7
1926	19	...	...	...	...	211.85	427.9
1927	20	...	...	...	...	223.00	439.1
1928	21	...	...	...	...	234.15	450.3
1929	22	...	...	...	...	245.30	461.5
1930	23	...	...	...	...	256.45	472.7
1931	24	...	...	...	...	267.60	483.9
1932	25	...	...	...	...	278.75	495.1
1933	26	...	...	...	...	289.90	506.3
1934	27	...	...	...	...	301.05	517.5
1935	28	...	...	...	...	312.20	528.7
1936	29	...	...	...	...	323.35	539.9
1937	30	...	...	...	...	334.50	551.1
1938	31	...	...	...	...	345.65	562.3
1939	32	...	...	...	...	356.80	573.5
1940	33	...	...	...	...	367.95	584.7
1941	34	...	...	...	...	379.10	595.9
1942	35	...	...	...	...	390.25	607.1
1943	36	...	...	...	...	401.40	618.3
1944	37	...	...	...	...	412.55	629.5
1945	38	...	...	...	...	423.70	640.7
1946	39	...	...	...	...	434.85	651.9
1947	40	...	...	...	...	446.00	663.1
1948	41	...	...	...	...	457.15	674.3
1949	42	...	...	...	...	468.30	685.5
1950	43	...	...	...	...	479.45	696.7

Formula, $y = mx + b$, where $m = 11.15$ and $b = 215.54$.

Note: E = sum.

when a series of plotted points do not show any special trend. It gives an average position of the series of points taken. Whether or not the extension of the straight line thus arrived at is an indication of future development, is an open question. The ton-mile results are higher than those found by the "I. C. C." method. By this curve, it may be noted that actual ton-miles for the year 1923 were higher than normal by 4.4 per cent.

(2) The "B. R. E." Method

All that the Chamber of Commerce of United States desired to forecast was the probable railway traffic for the year 1933 and the result published for freight traffic was

Revenue Ton-miles for 1933 = 564.635 billions.

For comparative purposes the method used will be applied to other years from 1923 to 1943.

a. Technical description. The continental population of the United States was used to find per capita ratios of ton-miles for certain decades, as follows:

Decades compared	Ton-miles per capita	Increase ton-miles per capita by decade
1910-1900	2,787-1,877	910
1920-1910	3,887-2,787	1,100
1923-1913	3,865-3,116	749

From the above data it was decided that the per capita ton-mile increase in a decade would average about 900 and this was added to the 1923 per capita ton-miles of 3865, making 4765 as the estimated ton-miles per capita for 1933. The next step was an estimate of the U. S. population for 1933 to which to apply this per capita ratio. By certain deductions from past records of natural growth and of increase due to immigration, the population for 1933 was estimated as 118,500,000. This figure multiplied by the per capita ton-mile ratio of 4765 gives as the ton-mile forecast for 1933, 546.653 billions.

b. *Discussion of method.* The results shown on Table 1B are higher than found by the two preceding methods. The per capita ratio of ton-miles increase per decade is excessive, but believed to be because of the influence which the abnormal

establishing this theory, only the rates of growth of the last thirty years covered by the four decennial censuses, 1890 to 1920, were used. Ratios of growth by annual increments within each of the three decades were derived by the formula, $y = ar^x$ where in each decade, y = population at end of decade; a = population at beginning of decade, or base year; r = ratio of annual increment, and x = years between base census and year desired. Solving for r by finding log of both terms, $\log y = \log a + x \log r$ or transposed $\log r = \frac{\log y - \log a}{x}$.

For the decade 1910-1920, using fiscal year data as of January 1,

$$\log r = \frac{\log 105,710,620 - \log 91,500,351}{10} = .0062693$$

$$r = 1.0145$$

Similarly for the double decade 1890-1910, the ratio of annual increment was found to be 1.0193. From these two

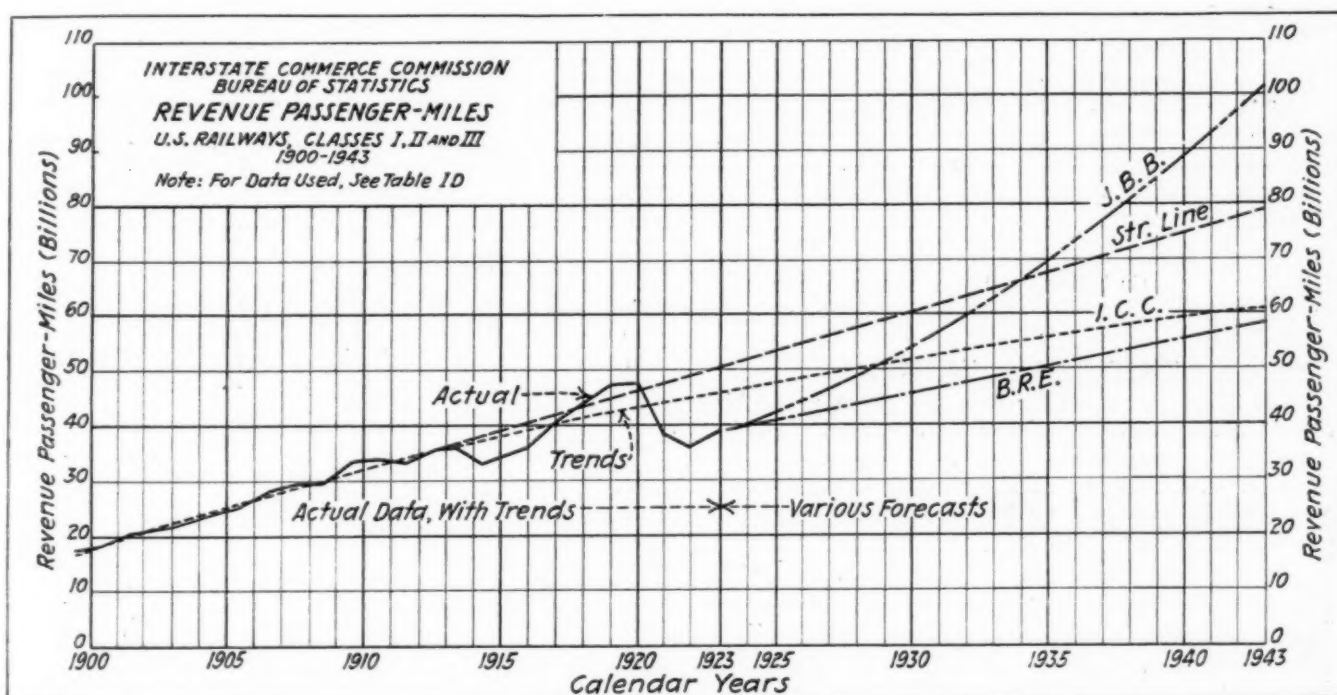


Fig. 2

traffic of the war and post-war period is allowed to have on the result. A study in which the undersigned used an asymptotic curve of population and the straight-line curve for ton-miles gives 500 as the increase in per capita ton-mile ratio for 1933 over 1923 in place of 900.

(3) The "J. B. B." Method

Certain phases of this method have already been discussed and analyzed by L. E. Peabody of the National Transportation Institute in the *Railway Age* of April 3, 1924. His principal and vital criticism is that the exponent (3.05) used in formula for ton-miles, mentioned here later, is not tenable, and the wide fluctuations of this exponent between the years 1909-1920, derived annually, proves its unsoundness and the lack of definite correlation between population and ton-miles. He concludes by stating that Mr. Blood's "formula for ton-mileage is unsuitable for the prediction of future traffic."

As this method is based primarily upon the growth of population, the treatment of this subject must be given particular attention.

a. *Technical description of population growth theory.* In

ratios, an annual increment ratio was "taken" as 1.016 to be used from 1920 to 1943. This ratio is very near the average (1.0169) of the two ratios 1.0145 and 1.0193. Such an assumption seems to be too arbitrary, as an average of past ratios in this case does not necessarily indicate future ratios, especially when the annual increment ratio of growth by decades from 1800 to 1920 is continually less as can be seen on Table 1C. This table gives for the decade 1920-1930, the ratio 1.0132, and for the decade 1930-1940, the ratio 1.0108, as annual increments of growth.

b. *The second step developed* was a ratio between the increase of ton-miles and increase of population. The ratio derived (3.05) is given as the power of population to be compared with ton-miles. This was found by the use of the data of the years 1900 and 1919 for both population and ton-miles. The use of 1919 as a normal year upon which to base any theory of ton-miles is unwarranted, as already noted by tables shown explanatory to logarithmic parabola curve and straight-line trend for ton-miles.

The method of derivation is as follows: To find x , the exponential function, in the relation between population and ton-miles, the exponential equation $y = a^x$ can be used, where

y = ton-mile ratio of increase, and a = population ratio of increase. The data used was—

Years	Population (millions)	Ton-miles (billions)
1900	76.0 (as of June 1)	140.5 (as of Jan. 1)
1919	104.1 (as of Jan. 1)	368.0 (as of July 1)

$$y = \text{ton-miles ratio of increase} = \frac{368.0}{140.5} = 2.62 \text{ (as given)}$$

$$a = \text{population ratio of increase} = \frac{104.1}{76.0} = 1.371 \text{ (as given)}$$

The equation $y = a^x$ is solved by taking logarithms

$$\log y = x \log a, \text{ or } x = \frac{\log y}{\log a}$$

$$\text{Exponent } x = \frac{\log y}{\log a} = \frac{\log 2.62}{\log 1.371} = \frac{.41830}{.13704} = 3.05$$

It can be seen that the data used are not in agreement as to dates. The data corrected for this difference give 2.9 as the exponent. Also it is found that using 1901 and 1914 data, the exponent is 2.9. The formula derived for the relation of ton-miles to population is given as

$$\text{TM} = \frac{2.57 P^{3.05}}{10,000}, \text{ where } P \text{ is population of continental U. S. in millions.}$$

The constant 2.57 is "m" in equation $y = ma^x$.

Using the exponent 2.9 instead of 3.05, the above formula becomes,

$$\text{TM} = \frac{4.96 P^{2.9}}{10,000}$$

A simple formula was derived by Mr. Blood for ton-miles as follows:

$$\text{TM (billions)} = 440 (1.05^y)$$

The 440 billion ton-miles for base year 1923 is too high, as 417.1 is the preliminary figure for that year. Here y is

TABLE 1C. U. S. POPULATION, ACTUAL AND BY ASYMPTOTIC CURVES
The Asymptotic Curve of Growth was Developed by Messrs. Pearl and Reed

Census years	Census population (as of June 1)	Using population by asymptotic curve			
		Population by asymptotic curve	Decennial increases	Per cent incr.	Annual increment ratios
1790	3,929,214	3,928,990			
1800	5,308,483	5,335,980	1,406,990	35.8	1.0318
1810	7,239,881	7,228,010	1,892,030	35.5	1.0308
1820	9,638,453	9,756,770	2,528,760	35.0	1.0305
1830	12,866,021	13,109,260	3,352,490	34.3	1.0300
1840	17,069,453	17,506,040	4,396,780	33.5	1.0294
1850	23,191,876	23,191,120	5,685,030	32.5	1.0285
1860	31,443,321	30,412,130	7,221,010	31.1	1.0275
1870	39,818,449	39,371,410	8,959,280	29.5	1.0262
1880	50,155,783	50,177,240	10,805,830	27.4	1.0245
1890	62,947,714	62,768,840	12,591,600	25.1	1.0226
1900	75,994,575	76,870,400	14,101,560	22.5	1.0205
1910	92,149,154	91,971,400	15,101,000	19.6	1.0181
1920	106,300,249	107,396,030	15,424,630	16.8	1.0156
1930		122,398,000	15,001,970	14.0	1.0132
1940		136,318,000	13,920,000	11.4	1.0108
1950		148,677,000	12,359,000	9.1	1.0086

Note—Asymptotic curve based on years (1790, 1850, 1910).

$$\text{Formula, Population} = y = \frac{be}{1 + ce^{ax}} = \frac{1}{\frac{e^{ax}}{b} + c}$$

Where x = years after 1780 (origin), and e = 2.7182818

$$y = \frac{e^{-.0313395x}}{2,930,300.9} + .014854$$

(See proceedings of the National Academy of Science, June 1920, pp. 275-288.)

*"True population" as estimated by Census Bureau.

the number of years after 1923 and this formula indicates a constant annual increase of 5 per cent over each preceding yearly ton-mile amount. The table given in the article is figured on this basis. This ton-mile ratio of increase is based on the 1.016 annual population increment ratio and the exponential ratio 3.05, that is, $1.016^{3.05} = 1.05$.

Using corrected data, already explained, for the decade

1920-30, the TM ratio = $1.0134^{2.9} = 1.039$, and the simple formula becomes, TM (billions) = 366 (1.04^y) where y equals years after 1920 and 366 is straight-line trend ton-miles at 1920. For the decade 1930-40, we find a new base (the year 1930) by this formula to be 541.7. Taking the annual increment ratio as found by the asymptotic curve of population (see Table 1C), which is 1.0108, and the exponential ratio 2.9, we derive the formula for 1930-40 ton-miles—

$$\text{TM (billions)} = 542 (1.032^y)$$

The resulting ton-miles from these formulae are shown in Table 1B for comparative purposes, as "asymptotic curve formula." But this result is believed by the writer to be too high because past ratios of ton-miles to population will not hold for the future.

Summary

To facilitate the study of the ton-mile forecasts resulting from the several methods outlined above, a rectilinear chart is presented of uniform scale. A double logarithmic chart

TABLE 1D—REVENUE PASSENGER-MILES AND FORECASTS
U. S. Railways, Classes I, II and III

Comparison of actual data with various derived amounts
(All in billions)

Years	Actual data	I. C. C. trend	Straight-line trend	Bur. of Ry. Econ.	J. B. B. Valuation analyst
FISCAL YEARS					
1900	16.038	15.387	16.601		
1901	17.354	17.252	18.035		
1902	19.690	19.039	19.468		
1903	20.916	20.755	20.901		
1904	21.923	22.405	22.334		
1905	23.800	23.995	23.767		
1906	25.167	25.530	25.200		
1907	27.719	27.013	26.633		
1908	29.083	28.446	28.066		
1909	29.109	29.837	29.500		
1910	32.338	31.185	30.933		
1911	33.202	32.492	32.366		
1912	33.132	33.762	33.799		
1913	34.673	34.995	35.232		
1914	35.357	36.195	36.665		
1915	32.475	37.362	38.009		
CALENDAR YEARS					
1916	35.220	39.056	40.248		
1917	40.100	40.148	41.681		
1918	43.212	41.213	43.115		
1919	46.838	42.251	44.548		
1920	47.370	43.264	46.081		
1921	37.706	44.252	47.414		
1922	35.811	45.216	48.847		
1923	38.400	46.158	50.280	38.987	38.3
FORECASTS					
1930		52.162	60.312	45.507	53.9
1933		54.460	64.612	48.468	62.4
1940		59.230	74.644	55.678	87.8
1943		61.060	78.943	58.936	101.6

(as was used by Mr. Blood) is misleading to the ordinary mind.

It is now a question of judgment, as to which appears most reasonable, taking into account the method of derivation, and the appearance on the chart of the resulting forecasts. The range seems at 1943 very divergent, and it would seem that the methods using population growth as a basis have introduced an unnecessary element which does not necessarily bear any close relationship to ton-mile growth.

The problem of judging of the future change in ton-miles involves not merely a mathematical analysis of past data, with a continuance of most of the forces which have operated in the past, but also a consideration of many new influences that will become more and more effective in the next few decades. Some modern tendencies will increase freight traffic and some will decrease it. As tending to increase freight transportation can be mentioned the growth of population, the expansion of domestic consumption due to more demand for material comforts and luxuries by succeeding generations, and the lowering of the cost of freight transportation by technical improvements.

On the other hand some decreasing tendencies in railroad

traffic are as follows: New competitive methods of transportation, such as motor truck, and air craft; more water competition by coast-wise service, inland canals and rivers, and Panama Canal; the movement of industries to avoid high rates; the migration of industries to source of supply, such as electric power stations locating at coal centers and transmitting power by long distance cables; new economic methods in industries, as for instance, the building industries where cement is replacing lumber, thereby shortening the haul, and the standardization of materials reducing varieties; and the competition of foreign countries in agricultural products. These are but a few of the factors that should be weighed in arriving at a careful conclusion, but it is extremely difficult, if not impossible, to give such factors a mathematical weight.

In this survey, no consideration has been given to the data covering "total tons carried" and "tonnage originated" separately from ton-miles, as these tonnages are but elements which multiplied by "miles carried" result in ton-miles. The average haul of freight, taking the railroads of the United States as a system, increased sharply from 1914 to 1919, but for the last six years (1918-1923) has not varied over 4 per cent (minimum 297 miles in 1918 and maximum 309 in 1919).

An increase in ton-miles through a lengthening of the average haul increases the road haul transportation service, but not the terminal service, and a change in ton-miles produced is, therefore, not a perfect index of the change in total service rendered by a railroad.

Passenger-Mile Forecasts

We now proceed to review the four methods above mentioned as applied to passenger-mile forecasts.

(1) *The "I. C. C. method"* again used a moving average for obtaining a smooth trend through years 1900 to 1914 inclusive and then a circular arc was found to fit the trend very closely, the formula for the arc being—

$$\text{Pass.-miles} = y = \sqrt{2842.7568 + 203.4182x - x^2} - 37.9307$$

(billions)

where x = years after January 1, 1900. This arc was continued into the future for forecasts, and the results are shown on Table 1D. Comparing same with the actual data, it will be seen that the passenger-miles of 1921, 1922 and 1923 are shown to be subnormal, the curve results being 116 per cent, 125 per cent and 119 per cent of actual passenger-miles, respectively. Apparently there has been a slump in passenger travel during the last three years, but whether or not this will continue below the pre-war normal trend is an open question.

(1A) *The straight-line trend method* can be applied to passenger traffic as already explained for ton-miles. Here

$$\text{the average height of ordinates, } b = \frac{399.501}{15} = 26.6334,$$

$$m = 1.43314$$

and the formula, $y = mx + b = 1.43314x + 26.6334$
The resulting passenger-miles found by this formula are considerably higher than by the I. C. C. method, and are shown on Table 1D.

(2) *The per capita method* for finding passenger-mile forecasts developed by the Special Committee, appointed by Chamber of Commerce of U. S. A. and sponsored by the Bureau of Railway Economics, is based on an assumption of 50 for the increase in ten years from 359 per capita in 1923 to 409 per capita in 1933. Using the estimated population of the U. S. of 118,500,000, we have (accepting 1923 as a normal year upon which to base future results),

$$\text{Passenger-miles (in 1933)} = 409 \times 118,500,000 = 48,468 \text{ millions.}$$

With this average annual increase of 5 per capita, results are shown for other years in Table 1D.

(3) *The J. B. B. method* as applied to passenger-miles derives 2.97 as the exponential function for passenger-mile relation to population. Apparently this ratio is based on the data for the years 1902 and 1919, and using the equation $y = a^x$, where "y" is the passenger-mile ratio of the two years mentioned and "a" is the population ratio of the same two years, solving for x as was explained under ton-mile forecasts. The passenger-mile forecasts are based on the formula, $y = ma^x$, which becomes

$$\frac{\text{Passenger-miles}}{(\text{in billions})} = \frac{4.54 P^{2.97}}{10^5}, \text{ when}$$

using the trend 1902-1919. But a lower basis has been chosen, namely the year 1923, for the starting point of forecasts and the above formula becomes

$$PM = \frac{3.18 P^{2.97}}{10^5}$$

A short formula is based on the assumed population increase ratio of 1.016 and the 2.97 ratio relation of passenger-miles to population. That is, the passenger-mile ratio of increase

$$= 1.016^{2.97} = 1.0483$$

making the formula for forecasts after 1923,

$$PM = 38.3 (1.0483)^x = 38.3 (1.05)^x$$

Thus the annual increase is 5 per cent for both ton-miles and passenger-miles.

General Comment on Passenger-Mile Forecasts

In order to help visualize the several forecasts obtained by the methods reviewed, a chart is attached. This chart shows the wide divergence of forecasts, and again it is a case of judgment as to which method leads to the most likely future volume of traffic.

A Railroad Phenomenon

By Ward W. Adair

WHEN GOOD OLD Cy Warman, in referring to locomotive engineers, coined that immortal description, "The silent heroes who stand alone and bore holes in the night at the rate of a mile a minute," he touched upon the romance of the rail that lures every red-blooded American boy when he arrives at the age when he is big enough, and brave enough, to stand near the "Choo-choo" when it comes snorting into the station. This mystic lure has been the theme of poets, painters, and story writers through many a decade.

But when one discovers a man, now well past 40, whose entire life has been lived under the spell of this charm, yet who has not actually worked a day for a railroad, he has found something that is slightly off the beaten trail. For years the writer had heard little sketches of the history of a man carelessly referred to as "the railroad bug," who lives in a town on the Lackawanna, which we shall call Granton, but it was only recently that he had the opportunity to come to close grips with this friendly and simple man, and learn something of the routine of his life.

Keen and smart in practically every other phase of the world's affairs, this man, through some curious mental twist, or some touch from the outside that came upon him while he was still unborn, has lived under a lifelong obsession that railroading is the summum bonum of human existence.

Given a choice between being President of the United States, or ambassador to the Court of St. James, and living his present life of continuous imagination, Jimmie Durstine

would not hesitate for the fraction of a second. You could take your presidency and your ambassadorship, and welcome to them. Jimmie will continue to "railroad," if you please, just as he has done for 40-odd years.

You may possibly think that he takes it out in talk. Not so. He is not of those who sometimes come to address public groups of railroad men, and who are rash enough to attempt railroad terminology, without realizing their lack of technical background, and who gets bells, whistles, triple valves, and hot boxes hopelessly mixed up in a jumble of words. No, Jimmie Durstine takes his railroading far more seriously than that.

His daily routine is along the following lines. Behind the splendid home of his well-to-do ancestors is a discarded trolley car, secured from the street railway company so long ago that the memory of man runneth not back to its advent. This car, with the additions he has made to it through the years, constitutes Jimmie's "train." A cow-catcher has been built on the front of it, and the rear has been partitioned off to provide an improvised caboose. There are all the necessary imitation whistles, bells, tail-lights, markers, lanterns, flags and fuses that heart might desire, and on stakes through the back yard run the air-line, bell-rope, and other facilities of a first-class and modern train. In the front end is a complete engineer's equipment, while in the rear may be found the customary trappings of the caboose. Realistic you say? Wait a minute.

This imaginary railroad man never sleeps at home, but goes to the Railroad Y. M. C. A., registers for a bed, and is unusually punctilious in reference to leaving his time to be called. The wonder increases as you realize that for untold years he has turned his back on a modestly luxurious home, where every comfort awaited him, and has chosen a three-foot cot in the railroad association building. He assigns himself to certain trains, according to his fancy, and will keep this run until, for some reason, he transfers himself to another division, or decides upon other hours of labor.

When he assigns himself to a particular run, he makes the scheduled trips, rain or shine, through heat or cold, and day or night. The association secretary testifies that he has seen him leave a call for 2 o'clock in the morning, and with the thermometer well below zero, get out of a warm bed, have his pail packed, plow through the deep snow, go over to his train, and for 15 and 16 hours work as hard as any man ever worked on the "really-truly" railroad. Nothing daunts or deters him when "duty" calls.

Having finished his "run," he will report back to the association building, wash up, eat breakfast or dinner, as the case may be, read the papers, play dominoes, compare his experiences with that of the other men who have been out on the road, and then go to bed, to repeat the operation when he has had his required rest.

If it were raining torrents, he would leave on time if he had to swim to get over to his "caboose." It has been a life-time practice of this conscientious conductor never to keep his train waiting for him. He requires his imaginary crew to be on time, and he exacts the same punctuality from himself, no matter what hardships may stand in the way.

Be it known, that he is strictly a Lackawanna railroad man, having cast his lot with the Phoebe Snow line in early boyhood, and remaining true to the dustless road of anthracite through all the years. He is probably the best informed railroad man on the road, in spite of the fact that all his railroading has been done in Imagination's fantastic realm. He knows every switch on the Lackawanna main line, and exactly how many cars each will hold. He not only knows the car capacity of every siding, but it is impossible to stick him on the running time of either passenger or freight train, between station and station, and he can always tell you where they meet and pass.

When he has made his "trip" he leaves a full report at the

association building of the train he had, his engineer, fireman, number of engine, kind of train, number of cars and tonnage. He makes full report of every train he passed, every delay he had, every block set against him, hot boxes, engine failures, poor coal, and all of the other items that go to make up the usual road trip. The assistant secretary at the association building acts as "trainmaster," and a complete file of Jimmie's reports is kept, and also copies of all orders that are put on the train-board at the dispatcher's office in Granton. This may seem like realism run riot, but Jimmie needs it all to satisfy his idea of good railroading.

We might think that the railroad men with whom he holds constant fellowship might get tired of him, or make fun of him. On the contrary, they are exceedingly careful never to hurt his feelings, never to lead him to suspect that he is not one of themselves. They try to stick him at times on technical questions about his trip, but such a thing is impossible. His ready and intelligent answers confound and amaze the knights of the rail who spend their entire time getting trains over the Lackawanna. Jimmie is admitted without question to the fraternity, and the men sit with him for hours at the domino table, where he is an inveterate player at such times as he is "laying off."

I was interested to get the reaction of the association secretaries, who perhaps have to stand for more from Jimmie than anybody else. They have a real affection for him, and bear with him with great patience. "Sometimes we get provoked at his foolishness," said one of the secretaries, "especially when he leaves calls at unearthly hours in the morning to go out in some of the worst kind of winter weather to sit over in a shed and run imaginary trains, but we realize that this is life itself to him; we see that his pail is properly packed, and give him good luck and a friendly send-off, as he starts out."

Who can tell the pictures that kindly Imagination may conjure for Jimmie as he journeys in fancy over curve and fill, through valleys spread with flowers, by the side of rushing streams, and in sight of verdant mountains? Pleasant pictures they must be, for he is a happy man, and his life, even though it moves in such a circle as is usually found in a little child, is full of peace and satisfaction. He envies no man, is entirely pleased with his environment, and his days pass in perfect contentment. In speech and bearing he is a gentleman, never has been known to use profanity, or do anything that might reflect upon his good name. He has a pipe or cigar in his mouth every waking moment, except at meals. He has acquired the swank of the veteran railroad man, which to him is the supreme attainment. Although modest, he is a first-class mixer, and does not realize that there is any oddity that makes him different from his brother railroad man.

Thus passes the life of this simple and unobtrusive man, on whom the spell of the railroad has cast its life-long charm. Those who know him best confess that it is rare to find such devotion to duty, even on the part of railroad men who are paid good salaries in return for their effort. Here is a railroad man who has never drawn a cent for his services, but who, for sheer love of his calling, has given a lifetime of conscientious effort to getting his imaginary train over the road. Let us hope and believe that when the Terminal is finally reached, and the conductor turns in his last report, the Great President will say "Jimmie, I congratulate you! It was a good run."

FREIGHT TRAFFIC handled by the Missouri Pacific in July exceeded in volume the record for any previous July in the history of the company, the number of cars loaded locally along the lines during the month totaling 95,155, and cars received from connections numbering 33,820. The average daily movement of all cars reached 31.72 miles per car per day, as compared with 30.05 in June and 27.06 in July, 1923.

Eleven Regional Shippers' Boards Now Organized

Pacific Coast Latest Territory Covered—Shippers Express Satisfaction with Results of Co-operation

THE PLAN adopted some months ago, on the initiative of the Car Service Division of the American Railway Association, to organize Regional Shippers' Advisory Boards in all parts of the country, will soon have been carried out. The latest board to be organized is the Pacific Coast Regional Board which was formed at a meeting in San Francisco on July 11. This board will have jurisdiction over the states of California and Nevada; over that portion of the Southern Pacific lines south of Ashland and Kirk; over the entire state of Arizona except the main and branch lines of the El Paso & Southwestern, and over New Mexico north of but not including the main line and branches of the El Paso & Southwestern, from El Paso to Arizona state line, west of but not including the line of the Santa Fe, from El Paso through Albuquerque to Santa Fe, and west of the Denver Rio Grande Western, from Santa Fe to the Colorado state line.

This is the eleventh of these boards to be organized, and the entire country is now covered except the North Pacific coast and New England.

The chairman of the Pacific coast board is Charles E. Verden, packer and fruit shipper of San Francisco. The vice-chairman is F. P. Gregson, manager of the Associated Jobbers of Los Angeles, and the general secretary is Norman H. Sloane, manager of the California Development Association. The meeting at San Francisco was attended by 230 prominent shippers and representatives of chambers of commerce, farm bureaus, public service commissions, and other public bodies, bankers, receivers of freight, and railroad men from all parts of the territory. Four of the 15 members at large of the board were elected and are Clyde Seavey, chairman of the California Railroad Commission; J. F. Shaughnessy, chairman of the Nevada Public Service Commission, Amos L. Betts, chairman of the Arizona Public Service Commission, and E. H. Williams, chairman of the New Mexico Public Service Commission. Other members at large will be named at a later date. The first meeting of the board will be held at Los Angeles on August 15 and its meetings thereafter will alternate between San Francisco and Los Angeles. The board has appointed 34 committees to represent shippers of various classes of commodities.

The organization of these shippers' advisory boards has been the most important development affecting the relations between the railways and their patrons that has occurred since the railways were returned to private operation four and a half years ago. The boards and all their committees are composed of shippers and public officials, such as members of public service commission, who represent the shipping public. Their function is to gather information regarding business and transportation conditions, especially the transportation needs of shippers, to present this information at meetings to the officers of the railways serving their territories, and to bring about such co-operation between the shippers and the railways as will enable the railways to best meet all the transportation needs of the shippers. Representatives of the railways and of the commodity committees of each board meet every 60 or 90 days and analyze the conditions in each territory commodity by commodity, together with the operating conditions and car supply on each line of railroad.

Before the meeting is adjourned the shippers and receivers of each commodity are acquainted with the problems and difficulties of the shippers and receivers interested

in other commodities, as well as with the problems and difficulties of the carriers.

Problem is Both Shippers' and Carriers'

The organization and functioning of the shippers' boards are based upon a recognition of the important fact, which not always has been plain to everybody and which formerly was seldom recognized, that the problem of providing adequate transportation service, and if the service available is not adequate, of equitably dividing it between different classes of shippers is a problem which can be satisfactorily solved only by a good understanding of the transportation situation by both shippers and receivers of freight, on the one hand, and railway officers, on the other, and by close and constant co-operation between them.

The problem is not a difficult one to solve in periods of business depression when the volume of freight business is comparatively small. It becomes, in periods of business activity, when the volume of freight business is extraordinarily large, a problem of great difficulty. At such times the railways greatly need the help of organizations representing all classes of shippers, who can give them detailed information regarding the transportation requirements of every section of the country and of every class of shippers. Only with such information available can the railways make the most efficient and equitable distribution of available cars and locomotives. They also require at such times the co-operation of shippers to prevent undue detention of cars in terminals, which results in congestions, and in consequence, delays all kinds of traffic, and also to bring about the heavy loading of cars and the promptest possible loading and unloading of them in order to enable the maximum amount of service practicable to be rendered with each car.

It is also extremely desirable for the railways at such periods to have frequent conferences with representatives of shippers of all classes in order that they may be able to give them full and correct information regarding transportation conditions. It has happened often in the past that the railways have been severely criticised for "car shortages" and delays to traffic for which they were not responsible, and many of these criticisms would have been avoided if the railways had had opportunity frequently to give the shippers the facts in conferences.

The first of the regional shippers' boards to be organized was that for the northwest. It has now been in existence almost two years. Several other boards also have been in existence for some months, and participated with the railways in the solution of the transportation problems presented in 1923 when the carriers succeeded in handling a record breaking freight business with unprecedented efficiency and satisfaction to the shipping public. Probably the best evidence available regarding the success that is being obtained thus far in this nationwide effort of the shippers and the railways to solve their mutual transportation problems is afforded by things that have been said regarding it by prominent railway regulating authorities and shippers.

Tributes to Work of Boards

A meeting to organize the Montana Division of the Northwest Regional Shippers' Board was held at Billings, Montana, on June 18 and 19. At this meeting J. W. Raish, vice-chairman of the Railroad Commission of South Dakota made an address in which he said among other things:

"I will say that the original attitude of the South Dakota Railroad Commission toward this proposition was one of desperate grasping. Ever since I have been a member of the South Dakota Commission, which is five years, as soon as the grain would begin to move or a little before, our board would brace ourselves for the annual car shortage. In July, 1922, the most severe car shortage that South Dakota ever saw began and it continued until March or nearly the first of April in 1923.

"This Northwest Regional Board was organized in January, 1923. The South Dakota Commission received an invitation to attend the organization meeting. The three members of the board got together and we were skeptical about the feasibility of the proposition or of the ultimate good that might be accomplished by such an organization, but the result of our deliberation in regard to this invitation was practically this, 'For God's sake let's try anything, this may help.' We went to that meeting and we have been co-operating with this movement ever since, because we knew what the movement meant to our shippers, shortly after it started and it is the one thing to our minds that has helped the shipper in respect to car shortage and the equitable distribution of available car supply. We are glad that we began our co-operation from the start and we are very glad to continue it.

"Now, as has been said here, a rather elaborate method has been devised for the getting of complaints before this board. To my mind that is the least important function of this board. To my mind the important function of this board and the important work that this board has done, is the work that it has done right in itself, as you might say; that is, not the handling of complaints as the complaints arise, but the elimination of the cause of the complaints.

"Now, for example, as I said we braced ourselves for this car shortage situation and in 1922 and the spring of 1923 there were months that our commission could handle practically nothing else. During the season of 1922-23 something over eight thousand complaints of car service were filed with our commission by telegraph, telephone and letter. One little item that might interest you is that during the month of August, 1922, the bill for telegraph and telephone tolls for our commission was \$387 that was in endeavoring to take care of these complaints, answering the complainants and that sort of thing.

"Now, this board got together and it did many things in eliminating the causes of the complaints. The first thing that was done was getting the cars to the west. It took a little time, but it was done and the cars eventually were properly distributed. Another thing that we had to contend with was the equitable distribution of available equipment among the livestock and grain dealers at particular stations, and you know there is one thing that is said about the average man, it is human nature I guess, and that is that the only thing that the average man wants is just a fair advantage over the other fellow. Now, that is what the shippers were trying to get in various ways. They would come in with complaints that they could not get any cars and that they had not had any cars for weeks. An investigation of a complaint might show that the complainant had in some manner got more cars than he was entitled to.

"Another thing that was done was for every man to exaggerate his needs, which is natural. A man would insist, for example, that on a certain day or during a certain week he would need forty cars to handle his stuff, when he knew that twenty cars would take care of his needs. He thought that by insisting upon having forty he might get the twenty. These are things that we had to contend with, and it was through the means of this Regional Advisory Board that we got those fellows to cut out that sort of thing; we got representatives to attend these board meetings and they were pinned down to their actual needs. There would be, for instance, a couple

of grain dealers from one point and you would pin one man down to a fair estimate of what his actual need would be, and his competitor would kind of look around and think, 'I guess maybe I had better come clean,' and in that way we started the process giving a reliable estimate of the needs for transportation of different commodities and I want to say just briefly what the result has been in the State of South Dakota.

Complaints Reduced from 8,000 to One

"As I say, in the season beginning in July, 1922, while we had something like eight thousand or more complaints filed as to car service, in the season of 1923 we had one, which was taken care of in four hours' time. I don't mean a promise of cars was made in four hours' time, but cars were put where they were needed in four hours from the time that complaint was filed. That was the one lonesome complaint that came before our commission in the season of 1923-1924. Now, that is what I mean when I say that the method which has been devised for the handling of complaints which come to this board is to my mind the least important function of the board. The important function of the board is the elimination of the complaints, and another very important result this board has brought about is the getting together, not only the shippers on one side and the railroad people on the other side, but getting the shippers themselves together, particularly the shippers of a certain kind of commodities."

C. W. McDonnell, a member of the North Dakota Railroad Commission said: 'We had the same trouble with distribution of grain cars in 1922. There were probably five or six thousand complaints received that year. The North Dakota Commission has been greatly interested in the Northwest Advisory Board. In the shipping season of 1923 I believe we had three complaints of car service and those were taken care of in less than twenty-four hours.'

One of the remarkable tributes paid to the work of the northwest board came from P. A. Lee of Grand Forks, North Dakota, Secretary of the Farmers' Grain Dealers Association. Referring to a meeting in Minneapolis early in 1923 he said: "We had a condition in North Dakota in the fall of 1922 that I think was almost enough to make anyone see red, and that meeting, I believe, has done more for this entire Northwest than anything else, because it brought about the organization of the Northwest Regional Advisory Board.

"I believe that this Regional Advisory Board has a double function to perform. It is not only to bring the shipper and the carriers together where they can iron out their differences and their problems, but aside from this I believe that in view of the continuous legislation affecting the carriers over the country the board has a mission to perform in letting the public know some of the difficulties that the transportation companies are up against themselves.

"I was asked several times when I came back from Minneapolis after attending the organization meeting if I had sold out to the railroads. I said, 'Well, if I have, they are damned poor pay, because I paid my own expenses down there,' and I said, 'Even if they are poor pay, conditions have been so bad in the Northwest that they could not be any worse, and for Heaven's sake, let's try this thing out and see how it is going to work.' They are all pleased that the board was organized now, and they are seeing the result not only of the Northwest Regional Advisory Board but I think of the boards that have been organized in the different parts of the United States. We want to push this thing along. I think it is worth working for. I am not here holding any brief for the railroads, but I have come to the conclusion that they have their trials and tribulations and difficulties just the same as we have in the grain business in North Dakota, and just the same as our farmers have their trials and troubles."

The organization and work of the regional boards has

been given emphatic endorsement by the Interstate Commerce Commission, the National Association Railroad and of Public Utilities Commissioners, Secretary of Commerce Hoover, the National Association of Manufacturers, the executive committee of the National Industrial Traffic League and many other organizations and persons of importance. The shippers have shown their active interest by attending the meetings in large numbers. In fact, although the organization of the boards was originally promoted by the Car Service Division of the American Railway Association, there have been intimations at times that shippers have been taking even more interest in them than the railways. Such an intimation seems to be conveyed by a statement that was made by W. H. McReynolds at a recent meeting of the Midwest Regional Board at Chicago. He said:

"I will say I have been very much surprised in the last three months or more since the original organization meeting at the lack of knowledge of the railway traveling men of the purposes of the board. Many of them knew nothing about it whatever. It seems to me the information ought to be passed along to the traveling men so they can spread that news as they travel through their territory and show what is going on."

This remark was extracted from the proceedings to be circularized among the railways.

An illustration of the work of the boards is afforded by an arrangement recently initiated by the Midwest Regional Board and the railways. The growth of traffic that must be handled in refrigerator cars has been so great and rapid that although there has been a very rapid increase in refrigerator cars the railways have had much difficulty in supplying sufficient cars of that kind. This has been partly due to the fact that cars have been unduly detained at terminals by shippers for reconsignment and other purposes. The railways proposed to impose a heavy penalty upon shippers to prevent these delays. Shippers handling perishable products objected to this and the result was the formation of a joint committee of shippers and railway officers to deal with the problem. The railways will check up cars and report all undue detentions to this committee and the shippers will themselves undertake to bring the matter to the attention of the persons or concerns responsible, and it is hoped that by this co-operative method greatly improved results will be secured.

Collision at Bridgewater, N. Y.

THE BUREAU OF SAFETY of the Interstate Commerce Commission has been called upon to investigate a collision, killing one passenger and one employee, which occurred on a railroad where there was no book of rules, no train sheet and no superiority of trains either by class or direction. There was no train despatcher, the issuance of orders, giving to trains rights other than those conferred by the time table, being attended to, when necessary, by the general passenger agent.

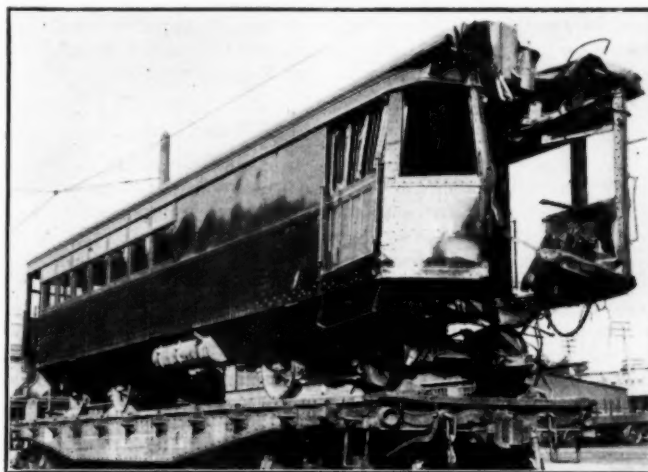
The road is the Unadilla Valley, 20 miles long, extending from Bridgewater, N. Y., southward to New Berlin. It operates four trains in each direction each week day; three passenger trains and one milk train.

Southbound passenger train No. 2, consisting of a single gasoline motor car, arrived at Bridgewater on June 20 (having begun its trip on the Delaware, Lackawanna & Western) at 8:12 a.m. where it should meet northbound freight train No. 15. After a stop of about two minutes it proceeded and collided with the freight about a quarter mile south, each train traveling at about 20 miles an hour. The locomotive of the freight penetrated the motor car about three feet; one passenger and the conductor of the passenger train were killed, and three passengers and one employee were injured.

The motorman was severely injured and all he could say was that the conductor gave the signal to proceed, and he proceeded; and he did not again think of train No. 15 until he heard its whistle. The conductor of No. 15 had telephoned from River Forks to the agent at Bridgewater that No. 15 was just starting northward; and the agent says that he gave the information to Motorman Dibble; Dibble made no reply but the agent took it for granted that his word was understood; and he was not alarmed when the conductor ordered his train to proceed, as the two trains usually met at the south end of the yard.

The conductor of No. 15 said that he had telephoned to Agent Dawson as an extra precaution, and that Dawson replied "All right, come ahead."

The regulation for the meeting of these two trains at the south end of Bridgewater yard is in the shape of a note printed on the time table, and the inspector finds that all of the employees involved were certainly familiar with this note.



Car Wrecked at Bridgewater, N. Y.

The general manager of the road said that a book of operating rules had not been adopted because it would have been confusing; as, until April 27 last, one crew operated all of the scheduled trains. Since then, however, the gasoline motor car has been placed in service, the additional train necessitating the making of one schedule meeting point.

The inspector does not accept the argument about confusion, as train No. 2 runs over the tracks of the Delaware, Lackawanna & Western and the men had passed an examination on the rules of that road. It is suggested that in addition to the simple instructions printed on the time table there should be a provision that trains should not leave a meeting point without receiving a clearance card.

The photograph of the wrecked gasoline car has been supplied by the J. G. Brill Company, Philadelphia, by whom the car was manufactured.

THE DEPARTMENT OF COMMERCE, Washington, proposes to "attack the high cost of shipping" by starting a campaign to reduce losses due to poor packing. The Domestic Commerce Division of the department, at the suggestion of the House Committee on Merchant Marine and Fisheries, has made studies showing that the losses to railroads during 1922 because of improper packing amounted to \$11,800,000. More than 5,000,000,000 containers are used in domestic shipping every year. The government proposes to secure the aid of the Forest Products Laboratories, the Chamber of Commerce of the United States, the American Railway Association, the American Society for Testing Materials, the National Association of Box Manufacturers, the Associated Cooperage Industries of the United States, the Wire-Bound Box Association and the American Railway Express.

General News Department

A magazine for the employees of the New York, New Haven & Hartford has been started by the company and the first number, dated July, has been issued, with an introduction by President E. J. Pearson. Mr. Pearson calls for the co-operation of all employees in making the enterprise a success. It is designed to promote the New Haven family spirit, and will aim to foster profitable personal contacts. The magazine has no name and employees are invited to suggest names. The first article in the July issue is historical, dealing with the Old Colony System. It calls attention to the age of the Fall River Boat Train, leaving Boston at 5 p. m., which has been running on that schedule for seventy-seven years. It is claimed to be the oldest train in the United States. This train is now No. 3187, an appellation which, no doubt, was very far from the thoughts of the men who first established it.

The Motley County's Ambition

The shortest railroad in Texas, the Motley County Railway, which has eight miles of track and only one paid officer, has asked permission of the Interstate Commerce Commission to extend its line 125 miles from Spur, Tex., to Memphis. The road, constructed in 1913 by local subscription, extends from Matador to Matador Junction, eight miles, connecting with the Quanah, Acme & Pacific. Its charter includes provision for the extension to Memphis. Financing will be done locally along the route. The present line transports approximately 15,000 bales of cotton annually and from 100 to 200 cars of grain and other farm products. Drilling for oil has been in progress for over a year. According to J. E. W. Thomas, traffic manager and auditor at Dallas, Tex., the one salaried officer, shippers along the line make up the deficits of the road and as a result it has never been in the hands of a receiver.

A Slogan for the Oriental Limited

In response to its offer of prizes for a slogan descriptive of its Oriental Limited train, the Great Northern received 7,367 slogans from 1,520 persons. They came from every state in the Union, and from Canada and Mexico. The first prize of \$250 was awarded to Roy Tingley, ticket seller on the Delaware, Lackawanna & Western at Dover, N. J., for the slogan, "As Wonderful as the Country It Serves." The second prize of \$125 was awarded to E. R. Harding, ticket clerk of the Chicago & Eastern Illinois at Hoopston, Ill., for the slogan, "The Train of Superlative Service." The third prize of \$75 was awarded to Wendell W. Neill, a clerk of the Chicago & North Western at Woodbine, Iowa, for the slogan, "Dependable, Delightful, Different." The fourth prize of \$50 was awarded to P. Johnson, ticket clerk of the Chicago & North Western at Hayfield, Minn., for the slogan, "Complete in Every Detail."

I. C. C. Report on Power Brakes

The Interstate Commerce Commission has withheld its approval of any particular power brake device and has accepted in principle certain functions which such systems shall perform. This attitude was explained in a report on its investigation of power brakes and appliances which was made public on August 7.

The functions approved by the commission are: (1) Ability to get an emergency brake application at full service after full release; (2) to control release of the brake by gradual steps; (3) ability to obtain and maintain brake cylinder pressure within prescribed limits for specific periods of time during brake applications.

Specifications and requirements covering more fully the function, maintenance and operation of power brakes should be adopted, the commission said. Consideration will be given to this and to the form of the commission's order later. The case will be held open for that purpose. The railroads and power brake companies will probably be called into conference with the commission before the specifications are entered.

Canadian Roads Show Increased Net

After declining in April and May, net earnings of the Canadian Pacific for the month of June showed an increase of \$37,648. The first half of 1924 came to a close with the road's net nearly a million dollars ahead of that of 1923. Net earnings for the month of June were \$2,459,649 and for the six months, \$10,390,084.

The statement of operating results for the first six months of the present year, issued by the Canadian National show a decrease of approximately \$1,050,000 in gross earnings and a reduction of \$2,090,000, in operating expenses. Net earnings for the period were \$2,629,430 as compared with \$1,591,357 accrued during the first half of last year, an increase of \$1,038,073 or 65.23 per cent.

Wage Statistics for May

The summary of wage statistics for the month of May, 1924, issued by the Interstate Commerce Commission, shows a total of 1,792,504 employees, an increase of 5,287 or 0.3 per cent over the number reported for the previous month. The total compensation was \$240,029,129, an increase of \$3,119,900 or 1.3 per cent. The increases in employment were confined largely to the maintenance of way group while considerable decreases occurred in the maintenance of equipment and transportation groups. The employment in the train and engine service group was smaller than in any month since September, 1922.

While there was an increase in the total number of employees of 5,287 in May, 1924, as compared with April, 1924, there was a decrease of 103,715 as compared with May a year ago.

As compared with April there was an increase in employees in the maintenance of way and structures department of 23,477; a decrease of 12,161 in the maintenance of equipment and stores departments and a decrease of 4,733 in train and engine service.

Comparison of May, 1924 with May 1923 shows a decrease of 1,068 in the maintenance of way and structures department, a decrease of 63,117 in the maintenance of equipment and stores department, and a decrease of 28,333 in the train and engine service.

The monthly earnings, by groups, were as follows:

Group	Monthly earnings of			
	Employees reported on daily basis		Employees reported on hourly basis	
	May, 1924	May, 1923	May, 1924	May, 1923
Executives, officials and staff assistants....	\$434	\$426	...	...
Professional, clerical and general.....	183	179	\$125	\$123
Maintenance of way and structures.....	240	239	89	92
Maintenance of equipment and stores....	243	242	124	130
Transportation (other than train, engine and yard).....	98	97	125	123
Transportation (yardmasters, switch tenders and hostlers).....	257	254	153	150
Transportation (train and engine service)....	...	...	189	193

Northern Pacific Group Life Insurance

The contract for group life insurance which the Northern Pacific is to enter into for the benefit of its 30,000 employees will represent a gross insurance of about fifty million dollars. All employees in the service six months will be given \$250 free and all one year in service \$500. For those in service one year, additional insurance may be written at the rate of about seventy or eighty cents per month per thousand dollars, the railway company paying for a part of this insurance.

This contract is contingent upon the acceptance of the insurance by 75 per cent of the employees eligible, and in other respects is subject to law like the similar contracts now in force on numerous other railroads. The usual provisions are made for the continuance of insurance if an individual leaves the service of the railway company. The Northern Pacific Hospital Service, the Northern Pacific Beneficial Association, and the railway company's pension system are continued in force precisely as at present.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1924

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income.	Net op. income 1923.
		Freight.	Passenger.	Total (inc. misc.).	Maintenance of way and structures.	Traffic.	Transportation.					
Akron, Canton & Youngstown.....	June 170	\$180,104	\$789	\$180,893	\$181,262	\$9,885	\$54,552	68.50	\$59,136	\$46,136	\$23,084	\$44,839
Alabama & Vicksburg.....	6 mos. 170	1,278,361	4,365	1,282,726	1,331,810	56,319	376,736	61.00	519,117	438,380	284,034	289,935
Alabama & Vicksburg.....	June 141	185,973	60,981	246,954	267,617	9,039	91,039	79.60	56,101	30,322	34,159	47,087
Alabama & Vicksburg.....	6 mos. 141	1,235,805	366,233	1,602,038	1,721,007	57,089	588,159	79.60	350,621	207,245	228,741	261,745
Vicksburg, Shreveport & Pacific.....	June 188	198,700	89,487	288,187	311,100	11,333	116,594	81.00	59,131	37,707	27,696	41,828
Ann Arbor.....	6 mos. 188	1,372,212	532,557	1,904,769	2,052,492	72,134	736,240	81.20	384,771	260,265	164,886	343,052
Ann Arbor.....	June 293	350,663	38,576	389,239	408,265	9,910	161,614	79.50	83,859	61,247	38,046	65,699
Ann Arbor.....	6 mos. 293	2,349,346	231,085	2,580,431	2,685,229	56,303	1,158,181	79.90	539,753	408,956	223,419	66,562
Atchison, Topeka & Santa Fe.....	June 9,040	9,163,910	4,099,281	13,263,191	14,355,016	320,672	4,726,262	81.80	2,648,046	1,697,023	1,770,169	2,430,989
Atchison, Topeka & Santa Fe.....	6 mos. 9,040	56,898,840	22,389,252	79,288,092	83,393,152	1,838,378	29,711,111	80.50	17,051,746	11,035,436	11,792,218	20,022,243
Gulf, Colorado & Santa Fe.....	June 1,908	1,368,036	30,975	1,399,011	1,440,468	46,350	640,857	89.90	185,244	106,781	23,890	179,084
Gulf, Colorado & Santa Fe.....	6 mos. 1,908	9,095,971	1,929,918	11,025,889	11,754,667	278,330	4,100,068	92.40	894,293	383,054	90,201	180,426
Panhandle & Santa Fe.....	June 858	450,688	122,203	572,891	612,855	8,365	214,197	101.20	-7,218	-30,964	74,354	-81,435
Panhandle & Santa Fe.....	6 mos. 858	3,305,687	717,225	4,022,912	4,276,393	47,650	1,355,016	88.00	640,697	492,560	264,664	84,847
Atlanta & West Point.....	June 93	117,368	73,388	190,756	219,372	9,255	86,135	88.10	26,041	19,450	10,964	41,056
Atlanta & West Point.....	6 mos. 93	814,113	436,429	1,250,542	1,438,249	51,414	535,262	80.30	282,350	210,584	140,943	213,255
Western of Alabama.....	June 133	131,230	68,110	199,340	221,578	9,563	75,130	84.30	34,704	26,492	27,084	54,396
Western of Alabama.....	6 mos. 133	965,502	412,211	1,377,713	1,531,100	58,621	475,039	74.90	383,537	306,268	277,626	298,746
Atlanta, Birmingham & Atlantic.....	June 639	277,285	43,698	320,983	347,424	22,089	155,353	99.50	1,647	11,030	19,757	44,025
Atlanta, Birmingham & Atlantic.....	6 mos. 639	1,899,082	249,787	2,148,869	2,338,039	131,772	1,005,014	93.20	157,693	80,601	9,170	-176,394
Atlantic Coast Line.....	June 4,864	4,575,626	1,138,344	5,713,970	6,167,081	130,225	2,283,601	76.70	1,437,133	985,767	869,281	807,519
Atlantic Coast Line.....	6 mos. 4,864	31,184,107	10,052,650	41,236,757	44,963,776	758,021	15,368,881	68.70	14,129,209	11,520,155	10,707,777	10,193,394
Charleston & Western Carolina.....	June 342	257,609	30,227	287,836	301,681	6,993	117,624	87.40	37,568	20,452	12,763	37,848
Charleston & Western Carolina.....	6 mos. 342	1,694,058	183,812	1,877,870	1,970,777	43,360	817,083	82.10	333,751	248,094	178,604	370,440
Baltimore & Ohio.....	June 5,303	13,113,590	2,702,614	15,816,204	17,165,370	364,597	6,420,714	75.00	4,295,160	3,455,665	3,142,666	4,004,590
Baltimore & Ohio.....	6 mos. 5,303	89,036,522	14,303,168	103,339,690	110,723,267	2,176,218	8,244,057	79.70	22,479,210	17,333,903	15,767,477	22,835,908
Baltimore & Ohio.....	Terminal 80	.....	.....	.....	790,758	1,861	159,161	94.90	14,886	26,721	12,844	29,607
Baltimore & Ohio.....	6 mos. 80	.....	.....	.....	322,481	11,494	1,068,496	100.10	1,919	-238,086	25,983	259,607
Staten Island Rapid Transit.....	June 23	86,972	124,791	211,763	242,149	2,501	118,527	95.00	11,997	-2,661	14,536	-201
Staten Island Rapid Transit.....	6 mos. 23	546,428	606,030	1,152,458	1,262,632	13,178	720,392	96.30	47,542	46,115	120,552	158,971
Bangor & Aroostook.....	June 616	291,879	57,577	349,456	379,427	4,092	138,487	105.30	19,936	43,933	63,867	78,262
Bangor & Aroostook.....	6 mos. 616	3,130,384	430,410	3,560,794	3,703,494	25,683	1,048,494	72.00	1,035,783	768,438	94,698	71,867
Belt Rv. of Chicago.....	June 32	.....	.....	.....	497,305	58,264	221,040	66.00	168,914	123,564	131,588	130,677
Belt Rv. of Chicago.....	6 mos. 32	.....	.....	.....	3,118,606	16,112	1,616,917	70.80	98,496	718,552	817,592	893,291
Besemer & Lake Erie.....	June 228	1,682,080	19,372	1,701,452	1,773,830	1,844	430,459	71.70	487,101	434,595	414,625	1,142,685
Besemer & Lake Erie.....	6 mos. 228	6,500,293	144,045	6,644,338	6,775,918	93,698	2,068,652	88.60	773,611	508,466	707,096	3,631,127
Bingham & Garfield.....	June 33	39,406	.....	39,406	40,539	1,280	11,133	80.00	8,088	-2,106	11,752	17,030
Bingham & Garfield.....	6 mos. 33	222,546	.....	222,546	231,407	34,845	62,727	80.00	53,144	9,310	81,080	96,614
Boston & Maine.....	June 2,287	3,663,196	1,669,603	5,332,800	6,154,006	61,694	2,671,068	82.80	1,059,986	798,634	654,864	885,308
Boston & Maine.....	6 mos. 2,287	23,430,310	10,306,961	33,737,271	38,419,626	324,528	17,525,904	84.30	6,048,351	4,560,902	3,297,421	837,002
Brooklyn Eastern District Terminal.....	June 9	115,078	.....	115,078	121,133	161	42,850	58.10	50,786	44,384	45,624	36,084
Brooklyn Eastern District Terminal.....	6 mos. 9	678,144	.....	678,144	721,657	2,340	264,561	59.00	295,691	252,668	259,988	337,896
Buffalo & Susquehanna R. R. Corp.....	June 253	1,063,196	4,192	1,067,388	1,145,966	1,888	40,214	170.40	-23,798	-25,348	7,650	49,766
Buffalo & Susquehanna R. R. Corp.....	6 mos. 253	6,500,293	33,465	6,533,758	6,775,918	11,811	322,275	105.70	-56,127	-87,031	96,305	434,517
Buffalo, Rochester & Pittsburgh.....	June 591	1,009,036	129,196	1,138,232	1,217,737	25,406	433,520	76.10	290,491	260,491	288,038	253,458
Buffalo, Rochester & Pittsburgh.....	6 mos. 591	6,864,615	834,030	7,698,645	8,070,083	153,075	3,278,629	88.70	910,206	714,468	998,676	1,696,319
Canadian Pacific Lines in Maine.....	June 233	86,640	30,185	116,825	141,209	4,943	74,556	187.00	-89,045	-100,045	-117,595	-74,876
Canadian Pacific Lines in Maine.....	6 mos. 233	1,208,089	224,074	1,432,163	1,528,203	27,727	669,680	87.40	192,262	126,262	40,323	72,852
Carolina, Clinchfield & Ohio.....	June 309	585,774	35,509	621,283	614,062	26,301	138,109	67.00	209,339	159,492	175,257	229,850
Carolina, Clinchfield & Ohio.....	6 mos. 309	3,830,080	228,411	4,058,491	4,564,464	151,361	1,126,606	69.70	1,257,284	957,022	1,203,104	1,378,942
Central of Georgia.....	June 1,970	1,332,345	427,945	1,760,290	1,945,128	71,179	797,049	86.10	269,325	182,852	175,497	240,235
Central of Georgia.....	6 mos. 1,970	9,179,533	2,712,631	11,892,164	13,141,171	414,657	5,018,424	79.10	2,742,937	2,110,789	2,077,237	2,101,926
Central of New Jersey.....	June 691	3,432,851	811,972	4,244,823	4,543,364	38,439	1,822,471	77.30	1,031,769	665,953	545,801	587,970
Central of New Jersey.....	6 mos. 691	20,850,598	4,295,415	25,146,013	28,580,617	216,273	11,051,502	82.40	4,719,362	2,511,526	2,041,078	2,516,568
Central Vermont.....	June 434	560,000	93,000	653,000	733,429	139,332	313,022	92.66	53,667	34,130	2,937	5,316
Central Vermont.....	6 mos. 434	3,285,842	581,361	3,867,203	4,280,638	76,564	2,037,969	91.18	377,502	263,664	73,585	137,671
Chesapeake & Ohio.....	June 2,558	7,319,054	981,133	8,300,187	8,735,009	106,310	2,527,513	73.60	2,305,816	1,930,223	2,074,862	1,803,793
Chesapeake & Ohio.....	6 mos. 2,558	43,515,492	5,285,316	48,800,808	52,000,242	581,739	16,396,294	75.70	12,432,058	10,177,501	11,003,539	9,428,045
Chicago & Alton.....	June 1,050	1,627,656	590,741	2,218,397	2,444,637	61,767	848,489	78.00	538,552	445,588	355,063	523,427
Chicago & Alton.....	6 mos. 1,050	10,244,305	3,153,976	13,398,281	14,799,507	356,770	5,609,759	79.70	3,008,425	2,456,676	1,866,320	2,389,524

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income.	Net op. income 1923.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equip-ment.	Traffic.	General.					
Chicago & Eastern Illinois.....	945	\$1,224,554	\$398,661	\$1,787,556	\$206,899	\$544,707	\$1,084	\$75,055	\$1,619,227	92.30	\$138,429	\$17,429	\$142,436
Chicago & North Western.....	945	9,399,160	2,373,871	12,798,388	1,365,405	3,941,913	304,505	413,430	11,515,414	90.00	1,282,934	627,834	1,712,299
Chicago & North Western.....	8,462	8,019,199	2,737,171	12,212,190	2,643,934	2,643,934	310,132	336,254	9,960,192	81.10	2,311,998	1,359,098	1,522,986
Chicago & North Western.....	8,462	48,669,732	14,618,795	71,317,784	9,867,726	15,795,007	964,428	2,096,692	67,198,814	84.40	11,119,070	6,575,759	4,980,937
Chicago, Burlington & Quincy.....	9,408	8,140,059	2,429,501	12,000,306	1,771,692	2,070,939	338,145	348,456	8,876,262	74.00	3,124,044	2,230,205	709,656
Chicago Great Western.....	9,405	5,297,212	1,275,173	7,942,979	871,499	1,691,700	1,501,289	2,137,154	5,838,949	76.80	17,604,030	12,350,480	11,031,844
Chicago Great Western.....	1,496	1,472,161	325,637	1,959,183	403,805	396,533	71,332	50,990	1,716,191	87.60	242,992	169,416	84,796
Chicago Great Western.....	1,496	8,677,599	1,953,828	11,596,201	1,635,818	2,461,336	389,340	325,248	10,015,140	86.40	1,581,061	1,126,624	865,804
Chicago, Indianapolis & Louisville.....	654	871,628	253,251	1,273,034	141,253	254,317	33,312	34,029	930,670	73.90	332,364	259,815	133,500
Chicago, Indianapolis & Louisville.....	654	6,036,441	1,527,374	8,391,819	893,370	1,805,127	200,591	207,762	6,304,812	75.10	2,086,947	1,661,487	890,809
Chicago, Milwaukee & St. Paul.....	10,986	8,789,175	1,966,115	12,158,495	2,288,781	2,885,111	209,932	305,258	9,917,974	81.60	2,240,521	1,435,834	1,174,556
Chicago, Milwaukee & St. Paul.....	6 mos.	55,721,120	11,059,442	74,864,975	11,607,848	17,822,358	1,158,905	1,979,744	63,884,696	85.30	11,016,279	6,227,097	6,669,015
Chicago, Peoria & St. Louis.....	247	74,826	10,924	94,052	19,226	14,387	1,570	8,292	94,236	100.20	—184	—4,037	—21,855
Chicago River & Indiana.....	247	472,527	80,429	612,112	106,458	104,412	10,746	49,461	607,893	99.30	4,219	—17,230	—144,773
Chicago River & Indiana.....	19	.....	.....	500,575	94,609	63,181	889	199,787	370,077	73.90	130,498	101,394	206,873
Chicago River & Indiana.....	19	.....	.....	3,490,532	440,156	385,381	5,377	70,117	2,320,295	66.50	1,170,237	942,586	1,553,501
Chicago, Rock Island & Pacific.....	7,594	6,537,584	2,183,662	9,431,420	1,198,963	2,284,157	220,793	298,564	7,965,085	84.50	1,466,335	925,198	489,099
Chicago, Rock Island & Pacific.....	6 mos.	40,341,508	12,416,436	57,007,733	6,610,741	15,267,665	1,237,203	1,760,664	47,506,692	83.30	9,501,041	6,339,941	4,017,291
Chicago, Rock Island & Pacific.....	461	406,235	80,258	525,564	140,461	67,228	14,352	16,188	451,132	85.80	74,441	61,875	18,055
Chicago, Rock Island & Pacific.....	461	2,257,752	458,770	2,955,073	430,560	406,600	83,054	98,397	2,274,903	77.00	680,170	604,660	410,595
Chicago, St. Paul, Minn. & Omaha.....	1,749	1,431,874	494,469	2,108,908	396,009	425,931	40,154	69,922	1,854,831	88.00	254,057	129,416	102,741
Chicago, St. Paul, Minn. & Omaha.....	1,749	9,256,634	2,950,200	13,244,942	1,680,295	2,675,190	216,421	438,210	11,089,327	83.70	1,155,615	1,406,204	1,117,676
Cincinnati, Indianapolis & Western.....	347	283,999	34,834	343,534	61,961	63,569	14,187	18,292	296,266	86.10	47,668	30,164	24,628
Cincinnati, Indianapolis & Western.....	347	1,788,576	89,477	2,115,214	286,916	447,916	81,418	889,652	1,818,335	85.90	297,095	189,633	73,502
Colorado & Southern.....	1,099	693,012	157,972	928,857	182,011	199,596	15,872	41,993	814,181	87.70	114,676	52,007	55,415
Colorado & Southern.....	6 mos.	4,721,555	832,293	6,043,152	772,354	1,550,627	83,713	2,632,064	5,143,895	85.10	899,257	522,624	497,911
Colorado & Southern.....	456	492,714	164,406	703,174	101,233	159,920	16,626	212,641	527,320	75.00	175,854	136,292	146,103
Colorado & Southern.....	456	3,465,615	897,225	4,444,760	463,294	1,071,210	86,248	210,034	3,289,563	70.80	1,355,197	1,114,100	1,205,499
Wichita Valley.....	271	72,229	23,010	104,008	18,352	10,629	1	1,945	64,629	62.10	39,379	31,947	24,924
Wichita Valley.....	271	672,922	139,324	863,028	146,126	64,676	204	262,624	482,165	55.90	386,863	334,902	222,474
Columbus & Greenville.....	167	87,488	23,419	111,147	47,055	16,500	2,894	9,537	62,185	104.30	—5,038	—14,778	—1,200
Columbus & Greenville.....	167	551,670	156,635	750,196	204,558	93,851	16,589	56,770	621,484	86.80	98,712	90,181	29,103
Delaware & Hudson.....	894	3,239,471	266,398	3,732,552	465,282	922,845	44,545	131,794	2,881,225	77.20	851,327	748,599	795,144
Delaware & Hudson.....	894	19,319,179	1,636,197	22,169,430	2,902,664	6,115,903	8,707,210	842,217	18,957,611	85.50	2,211,819	2,591,601	2,760,975
Delaware & Hudson.....	992	5,119,690	1,144,684	7,101,281	771,367	1,490,733	108,068	166,186	5,247,980	73.90	1,853,301	1,297,804	1,341,507
Delaware & Hudson.....	992	31,683,205	6,398,007	42,890,674	3,858,431	9,381,743	708,955	963,739	32,736,949	76.30	10,153,725	6,919,400	7,281,604
Denver & Rio Grande Western.....	2,605	1,789,434	501,640	2,523,914	661,546	635,113	50,467	83,031	2,264,146	89.70	259,768	95,421	165,838
Denver & Rio Grande Western.....	2,605	10,950,483	2,276,723	14,450,600	2,331,282	3,888,536	308,871	503,629	12,237,670	84.70	2,212,930	1,207,753	997,285
Denver & Salt Lake.....	255	198,646	37,074	261,020	107,151	87,058	1,768	7,283	276,813	106.10	—15,793	—24,793	—80,019
Denver & Salt Lake.....	255	1,052,329	144,056	1,377,085	351,537	568,462	7,336	39,357	1,406,526	106.00	—79,441	—133,450	—103,289
Detroit & Mackinac.....	375	139,109	21,435	177,902	46,818	39,013	2,494	6,764	151,212	85.00	26,690	16,518	19,605
Detroit & Mackinac.....	375	696,113	158,936	847,717	177,538	226,174	12,314	363,004	810,791	86.80	123,334	123,334	27,365
Detroit & Mackinac.....	61	219,704	.....	223,881	38,399	28,879	2,871	6,241	184,298	68.90	69,583	49,083	65,141
Detroit & Mackinac.....	61	1,712,302	.....	1,738,160	212,217	195,086	17,510	585,553	1,055,075	60.70	683,085	545,670	483,136
Detroit Terminal.....	18	.....	.....	156,142	47,649	10,353	28	82,759	142,659	91.36	13,483	—2,065	10,896
Detroit Terminal.....	18	.....	.....	1,191,025	168,005	68,570	36	623,257	1,025,119	73.06	320,906	201,130	293,123
Detroit, Toledo & Ironton.....	468	761,983	7,490	788,323	154,423	172,626	6,099	23,884	567,036	74.56	201,287	166,337	98,965
Detroit, Toledo & Ironton.....	468	5,890,554	48,341	6,031,614	729,803	969,785	43,116	151,306	3,595,754	59.60	2,435,860	2,224,585	859,867
Duluth & Iron Range.....	280	865,439	8,606	950,446	239,069	109,533	1,726	23,487	579,204	60.90	371,242	312,652	313,319
Duluth & Iron Range.....	280	2,335,889	84,717	2,654,559	654,300	792,222	6,936	129,943	2,575,991	97.00	78,568	—99,627	—110,932
Duluth & Iron Range.....	304	1,950,353	9,617	2,100,822	184,303	202,029	2,978	23,627	2,575,366	36.10	1,343,456	1,122,370	1,113,988
Duluth & Iron Range.....	304	4,797,715	71,856	5,244,629	1,076,107	1,245,450	18,332	3,811,408	3,811,408	72.70	1,433,221	654,055	1,425,892
Duluth, South Shore & Atlantic.....	591	382,552	86,588	523,759	141,542	70,440	6,427	10,591	434,904	83.00	88,855	56,855	43,401
Duluth, South Shore & Atlantic.....	591	2,144,925	570,117	2,915,042	486,276	792,641	3,614	2,421,433	2,421,433	81.70	539,232	352,151	199,258
Duluth, South Shore & Atlantic.....	178	1,244,520	18,451	1,500,400	88,754	178,540	3,614	6,584	1,334,544	122.20	—13,414	—40,836	—13,665
Duluth, South Shore & Atlantic.....	178	1,040,555	118,304	1,193,809	216,466	206,750	19,485	981,952	981,952	82.20	211,874	151,494	162,455
Elgin, Joliet & Eastern.....	459	1,310,226	—	1,422,033	211,288	351,474	12,009	58,171	1,153,433	81.10	268,600	185,981	65,218
Elgin, Joliet & Eastern.....	459	10,472,063	168,947	11,371,128	2,433,784	2,433,784	75,038	4,772,111	8,338,743	72.10	3,212,704	2,739,808	1,665,074
El Paso & Southwestern.....	1,139	915,499	1,078,892	6,271,737	1,371,827	1,371,827	43,239	43,088	7,722,111	67.90	2,735,716	1,666,605	1,008,227
El Paso & Southwestern.....	1,139	4,877,359	1,078,892	6,271,737	1,371,827	1,371,827	43,239	43,088	7,722,111	75.40	1,544,518	1,032,075	716,603

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Total.	Operating ratio.	Net from railway operation.	Net operating income (or loss).	Net on income 1923.
		Freight.	Passenger.	Total (inc. misc.)	Traffic.	Trans- portation.	General.					
Erie R. R.....	June 2,055	\$6,177,773	\$1,116,063	\$8,032,119	\$157,800	\$3,192,814	\$293,129	\$6,917,351	86.10	\$1,114,768	\$772,087	\$1,560,336
	6 mos.	40,823,283	6,295,435	51,370,999	875,821	20,566,267	1,688,617	43,875,031	85.40	7,495,968	5,409,254	8,230,881
Chicago & Erie.....	June 2,055	777,945	77,384	966,084	139,811	345,036	37,279	663,336	68.70	302,748	250,063	24,808
	6 mos.	6,031,378	355,185	6,952,533	714,806	2,475,031	220,699	4,464,675	64.20	2,487,858	2,171,582	475,880
New Jersey & New York.....	June 45	21,930	107,992	135,662	1,368	38,181	3,295	101,029	74.50	34,633	30,364	—961
	6 mos.	142,879	601,606	749,239	110,526	272,722	21,925	649,191	83.70	126,048	103,860	—89,105
N. Y., Susquehanna & Western.....	June 135	254,508	59,825	356,508	57,720	189,751	10,393	327,918	92.00	28,598	—578	19,749
	6 mos.	1,658,063	350,487	2,283,613	320,860	1,246,884	64,537	2,175,958	95.30	108,015	—73,451	151,575
Evansville, Ind. & Terre Haute.....	June 143	113,009	4,675	124,132	46,997	17,941	49,893	117,728	94.80	6,404	1,386	—8,829
	6 mos.	779,244	39,366	854,431	188,543	95,150	20,319	650,837	76.20	203,475	174,712	61,838
Florida East Coast.....	June 763	671,951	287,913	1,074,237	231,349	389,060	12,787	603,679	84.10	170,558	72,794	30,221
	6 mos.	6,183,062	3,448,518	10,925,104	1,352,575	1,564,870	206,311	6,793,025	62.20	4,132,079	3,531,667	2,904,699
Fort Smith & Western.....	June 249	103,826	17,014	130,413	28,467	5,066	7,575	112,870	86.50	17,543	11,742	—7,607
	6 mos.	638,185	113,434	808,328	179,737	31,593	46,550	720,851	89.20	87,477	72,034	36,737
Galveston Wharf Co.....	June 13	.....	.....	68,261	35,193	4,408	793	70,565	103.40	—2,304	—19,304	—19,244
	6 mos.	.....	.....	551,748	236,168	5,049	16,420	472,955	85.70	78,793	—22,492	57,555
Georgia R. R.....	June 328	331,786	94,001	458,239	53,916	22,745	211,915	421,585	92.00	36,654	29,587	114,439
	6 mos.	2,161,665	571,426	2,938,797	326,855	133,013	1,304,760	2,465,302	83.90	473,495	431,303	367,236
Georgia & Florida.....	June 406	93,122	77,388	111,068	41,680	8,177	7,051	100,771	84.60	18,297	11,864	14,655
	6 mos.	685,127	109,818	845,045	103,110	49,560	48,363	655,764	77.30	192,281	153,191	79,356
Grand Trunk Western.....	June 347	1,065,954	213,013	1,384,144	279,547	48,873	567,254	1,323,365	95.60	60,779	—19,032	163,721
	6 mos.	7,737,372	1,044,232	9,330,343	1,111,736	254,654	306,134	8,033,053	96.00	1,307,290	865,806	167,496
Atlantic & Saint Lawrence.....	June 166	106,929	30,132	132,638	100,300	34,455	8,500	124,855	181.80	73,395	—88,555	—136,373
	6 mos.	993,389	196,314	1,282,762	367,192	66,179	54,357	1,498,936	116.80	—216,235	—307,201	—693,441
Chi., Det. & Canada Gr. Tr. Jet.....	June 59	192,653	12,007	237,146	73,609	6,320	77,355	167,484	70.60	69,662	55,690	29,421
	6 mos.	1,296,660	54,134	1,573,843	169,483	34,992	20,321	812,093	51.60	761,250	699,912	538,437
Det., Grand Haven & Milwaukee.....	June 189	5	.....	476,710	41,435	13,120	14,860	417,711	82.60	58,999	53,632	37,211
	6 mos.	237,778	3,279,744	543,956	293,734	84,471	1,496,934	92,467	76.60	768,947	737,899	208,488
Great Northern.....	June 8,251	6,766,392	1,220,951	8,555,612	1,468,384	147,204	214,991	6,207,694	70.30	2,657,918	1,802,553	1,814,628
	6 mos.	34,251,428	6,229,771	45,777,659	6,813,052	1,063,934	1,310,885	36,067,963	70.90	9,600,696	4,976,133	5,810,101
Green Bay & Western.....	June 234	101,251	9,349	116,874	26,091	3,398	4,326	97,000	82.90	13,874	12,350	5,482
	6 mos.	599,424	94,424	735,974	120,083	19,776	14,719	564,550	76.76	171,222	125,976	101,316
Gulf Coast Lines.....	June 922	883,485	181,994	1,147,821	30,256	256,091	38,802	665,549	57.98	482,272	417,627	397,737
	6 mos.	5,765,758	1,064,366	7,558,245	179,358	1,825,134	224,020	4,766,360	57.81	3,061,066	2,734,710	2,341,226
Gulf & Ship Island.....	June 307	186,226	38,478	256,232	46,445	8,979	77,050	133,325	78.50	35,192	33,133	35,328
	6 mos.	1,335,201	227,111	1,759,944	244,404	48,680	82,486	1,214,910	70.60	517,270	362,761	255,773
Gulf, Mobile & Northern.....	June 465	375,790	34,638	429,890	72,191	80,364	19,961	338,253	76.68	91,637	68,649	55,240
	6 mos.	2,596,907	234,263	2,951,788	460,962	457,992	118,489	2,122,984	71.92	828,704	601,407	579,477
Hocking Valley.....	June 348	1,332,046	75,563	1,571,496	153,791	419,188	36,311	1,060,951	67.50	510,521	417,397	401,643
	6 mos.	7,084,939	461,083	8,174,304	825,865	2,356,176	215,936	6,024,217	73.70	2,020,987	1,591,692	1,650,224
Illinois Central.....	June 4,847	8,577,152	2,109,990	11,590,831	1,752,570	3,013,686	318,204	9,565,891	82.50	2,024,940	1,304,300	1,364,269
	6 mos.	56,812,614	12,964,614	75,444,192	9,501,868	17,919,415	1,915,319	58,449,639	78.00	16,594,353	11,540,185	12,325,782
Yazoo & Mississippi Valley.....	June 1,380	1,112,899	282,673	1,487,166	259,206	297,486	42,712	1,254,796	84.40	232,370	116,990	35,860
	6 mos.	7,774,729	1,824,582	10,155,896	1,553,362	1,807,352	261,280	7,743,351	76.20	2,412,545	1,719,982	1,643,098
Illinois Central Combined Report.....	June 6,227	9,690,031	2,392,663	13,077,997	2,011,776	3,311,172	360,916	10,320,687	82.70	2,257,310	1,421,290	1,430,861
	6 mos.	64,586,853	14,789,196	85,600,088	11,055,230	19,119,415	2,176,599	66,592,990	77.20	19,007,098	13,260,167	13,968,880
International Great Northern.....	June 1,159	516,353	232,642	1,177,340	256,325	297,486	31,819	1,061,166	87.58	146,164	110,882	89,640
	6 mos.	5,606,173	1,252,522	7,685,912	1,534,812	1,500,068	295,679	6,517,840	84.80	1,168,072	938,125	615,607
Kansas City, Mexico & Orient.....	June 272	135,519	8,452	151,420	36,684	69,891	7,115	150,294	99.30	1,126	—8,874	—23,450
	6 mos.	827,852	44,682	913,325	193,885	29,259	34,559	899,951	98.50	13,374	—25,567	—109,748
Kans. City, Mex. & Orient of Tex., June 465	152,296	12,900	569,750	41,380	5,746	66,012	7,488	146,657	86.40	23,093	16,093	7,732
	6 mos.	65,425	994,346	221,544	32,438	419,438	35,417	909,618	91.50	84,728	57,660	—24,025
Kansas City Southern.....	June 767	1,080,461	166,938	1,407,010	43,550	479,799	76,302	1,076,595	76.50	330,415	246,724	214,926
	6 mos.	7,188,316	958,056	8,962,712	246,630	3,064,573	450,820	6,191,272	76.10	2,146,440	1,605,473	1,372,703
Texarkana & Ft. Smith.....	June 81	174,061	14,813	204,098	6,296	60,919	9,066	119,174	58.40	84,924	69,326	1,584,864
	6 mos.	1,219,264	85,772	1,412,683	135,047	30,160	375,488	732,269	51.80	680,414	587,448	417,661
Kansas, Oklahoma & Gulf.....	June 314	127,511	7,680	140,854	43,550	479,799	76,302	1,076,595	76.50	330,415	246,724	214,926
	6 mos.	916,235	59,054	1,011,391	48,850	411,134	71,033	963,407	95.10	47,984	—12,748	—4,830
Lake Superior & Ishpeming.....	June 162	185,593	2,779	216,888	7,116	22,488	55,015	124,043	61.80	82,645	63,135	95,602
	6 mos.	639,337	32,658	744,684	212,068	144,224	32,658	638,145	85.70	106,488	16,420	—2,085
	6 mos.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation		Net op. income 1923.
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Traffic	Trans- portation		Operating income (or loss)	Net income	
Lake Terminal	13	.....	.....	\$96,432	\$14,440	.....	\$59,760	98.70	\$1,292	.....	\$21,198
Lake Erie	6 mos.	.....	.....	517,073	106,005	.....	331,313	104.80	24,786	.....	42,242
Lehigh & Hudson River	6 mos.	.....	.....	\$3,385	261,412	.....	98,065	72.50	72,018	.....	111,093
Lehigh & New England	6 mos.	.....	.....	1,575,758	181,542	10,584	589,303	70.70	462,286	.....	377,535
Lehigh Valley	6 mos.	.....	.....	467,206	1,553	8,923	138,441	69.70	144,465	.....	205,372
Los Angeles & Salt Lake	6 mos.	.....	.....	2,407,292	335,524	39,239	819,314	80.30	493,391	.....	778,974
Louisiana	6 mos.	.....	.....	670,747	6,244,092	128,873	2,391,104	79.20	1,300,547	.....	1,012,023
Louisiana & Arkansas	6 mos.	.....	.....	3,432,437	37,320,730	675,544	15,498,455	81.60	6,876,727	.....	631,720
Louisiana Ry. & Nav. Co.	6 mos.	.....	.....	587,409	370,631	64,535	629,240	75.50	516,710	.....	479,055
Louisiana Ry. & Nav. Co. of Tex.	6 mos.	.....	.....	2,961,936	2,354,115	371,843	3,954,252	79.60	2,541,604	.....	1,461,021
Louisiana Ry. & Nav. Co. of Tex. & Ark.	6 mos.	.....	.....	36,969	295,027	9,243	87,226	81.70	53,892	.....	27,416
Louisiana Ry. & Nav. Co. of Tex. & Ark. & La.	6 mos.	.....	.....	208,329	1,926,420	52,883	564,303	75.20	477,927	.....	496,079
Louisville & Nashville	6 mos.	.....	.....	22,900	326,298	9,772	124,417	82.90	55,919	.....	7,884
Louisville, Henderson & St. Louis	6 mos.	.....	.....	143,719	1,851,285	64,496	798,460	90.80	170,972	.....	27,695
Maine Central	6 mos.	.....	.....	10,532	94,581	3,316	44,352	93.00	6,352	.....	13,110
Midland Valley	6 mos.	.....	.....	69,348	615,969	20,284	308,654	93.90	37,355	.....	47,825
Minneapolis & St. Louis	6 mos.	.....	.....	2,234,637	407,895	35,962	656,179	67.00	737,617	.....	587,843
Minneapolis, St. Paul & S. S. Marie	6 mos.	.....	.....	1,072,016	277,146	29,737	483,636	109.60	102,444	.....	67,380
Mississippi Central	6 mos.	.....	.....	764,130	7,005,920	166,727	3,334,241	102.80	195,344	.....	531,618
Missouri & North Arkansas	6 mos.	.....	.....	584,873	3,677,297	72,488	1,448,614	84.20	579,228	.....	954,189
Missouri-Kansas-Texas	6 mos.	.....	.....	3,202,988	20,904,581	385,927	9,202,387	86.00	2,924,232	.....	2,949,655
Monongahela	6 mos.	.....	.....	14,801	138,768	6,427	37,696	77.50	31,274	.....	10,008
Monongahela Connecting	6 mos.	.....	.....	782,933	89,965	167,810	259,164	73.00	243,991	.....	152,673
Montour	6 mos.	.....	.....	1,786,589	473,050	50,386	737,122	108.10	8-533	.....	2,209
Nashville, Chattanooga & St. Louis	6 mos.	.....	.....	2,687,718	15,561,068	306,418	4,508,357	99.30	4,776,752	.....	546,689
Nevada Northern	6 mos.	.....	.....	2,416,503	9,261,243	1,486,303	3,725,339	79.10	1,939,465	.....	661,988
Newburgh & South Shore	6 mos.	.....	.....	1,517,065	9,074,115	228,238	3,329,620	82.20	1,617,285	.....	488,695
New Orleans Great Northern	6 mos.	.....	.....	8,641,132	56,882,456	1,206,579	22,112,150	82.10	10,198,465	.....	3,291,241
New York Central	6 mos.	.....	.....	146,717	1,468,455	47,112	520,498	75.80	355,335	.....	214,598
New York Central & Hudson River	6 mos.	.....	.....	931,059	9,996,957	282,260	3,505,416	72.40	2,785,628	.....	1,659,192
New York Central & Hudson River	6 mos.	.....	.....	24,836	308,458	1,035	92,954	79.40	63,492	.....	109,892
New York Central & Hudson River	6 mos.	.....	.....	2,324,681	330,000	6,396	706,603	69.70	704,605	.....	469,494
New York Central & Hudson River	6 mos.	.....	.....	129,604	15,834	374	63,757	91.50	11,007	.....	21,811
New York Central & Hudson River	6 mos.	.....	.....	1,098,788	134,918	2,279	580,702	91.00	92,549	.....	96,397
New York Central & Hudson River	6 mos.	.....	.....	152,995	31,031	977	213,718	79.90	30,707	.....	124,114
New York Central & Hudson River	6 mos.	.....	.....	6,180	732,637	6,019	43,670	95.00	36,491	.....	518,912
New York Central & Hudson River	6 mos.	.....	.....	401,997	1,757,075	74,443	691,500	89.50	184,083	.....	228,911
New York Central & Hudson River	6 mos.	.....	.....	2,422,358	11,778,177	461,774	4,578,594	85.60	1,700,002	.....	1,898,371
New York Central & Hudson River	6 mos.	.....	.....	11,328	84,885	818	13,807	51.70	40,997	.....	56,697
New York Central & Hudson River	6 mos.	.....	.....	58,016	80,741	5,421	100,159	50.60	254,646	.....	199,962
New York Central & Hudson River	6 mos.	.....	.....	516,443	48,777	.....	63,457	106.00	23,551	.....	10,246
New York Central & Hudson River	6 mos.	.....	.....	1,554,552	46,923	.....	417,437	91.80	81,615	.....	31,095
New York Central & Hudson River	6 mos.	.....	.....	1,005,021	325,496	.....	23,969	75.20	58,978	.....	68,714
New York Central & Hudson River	6 mos.	.....	.....	31,187	338,220	5,191	78,780	70.60	437,304	.....	377,305
New York Central & Hudson River	6 mos.	.....	.....	177,565	1,485,825	32,617	462,541	72.10	8,403,087	.....	9,001,560
New York Central & Hudson River	6 mos.	.....	.....	9,312,602	30,158,143	338,117	10,329,593	75.90	44,116,513	.....	39,848,234
New York Central & Hudson River	6 mos.	.....	.....	46,236,358	183,133,728	2,118,497	69,086,104	66.40	115,972	.....	56,154
New York Central & Hudson River	6 mos.	.....	.....	10,661	345,560	5,395	22,558	69.60	715,811	.....	487,300
New York Central & Hudson River	6 mos.	.....	.....	66,772	2,352,942	32,940	824,546	80.00	1,335,145	.....	452,136
New York Central & Hudson River	6 mos.	.....	.....	6,673,750	994,270	119,792	2,426,288	80.00	1,335,145	.....	1,776,846
New York Central & Hudson River	6 mos.	.....	.....	8,244,137	42,623,775	688,413	16,618,004	77.90	9,442,252	.....	6,051,829
New York Central & Hudson River	6 mos.	.....	.....	833,981	160,643	4,231	346,318	78.60	178,389	.....	142,361
New York Central & Hudson River	6 mos.	.....	.....	5,382,427	667,481	27,630	2,509,918	75.60	1,313,570	.....	1,150,994
New York Central & Hudson River	6 mos.	.....	.....	6,823,069	914,132	131,222	2,374,903	72.50	1,876,376	.....	1,361,019
New York Central & Hudson River	6 mos.	.....	.....	44,201,484	5,089,385	612,254	15,722,033	71.80	12,472,632	.....	9,249,225
New York Central & Hudson River	6 mos.	.....	.....	255,350	2,217,933	22,786	730,263	83.50	365,323	.....	1,887,890
New York Central & Hudson River	6 mos.	.....	.....	1,527,120	16,459,939	152,056	5,406,326	78.80	3,485,777	.....	8,912,221
New York Central & Hudson River	6 mos.	.....	.....	1,950,013	3,985,456	123,410	1,474,023	77.70	658,464	.....	1,030,296
New York Central & Hudson River	6 mos.	.....	.....	966,667	26,948,861	711,754	10,315,047	76.90	6,226,296	.....	3,971,931
New York Central & Hudson River	6 mos.	.....	.....	24,974,119	966,667	.....	.....	.....	.....	.....	5,759,152

MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road	Average mileage operated during period.	Operating revenues—		Total (inc. misc.)	Maintenance of way and structures.		Operating expenses—		Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income.	Net op. income 1923.
		Freight.	Passenger.		Equipment.	Traffic.	Transportation.	General.						
New York, New Haven & Hartford	1,986	\$5,073,016	\$4,315,335	\$10,583,870	\$1,803,406	\$2,195,392	\$69,675	\$3,809,693	\$272,364	78.30	\$2,295,944	\$1,890,881	\$1,399,568	\$1,620,623
New York, New Haven & Hartford	6 mos.	1,993	31,313,176	24,034,577	62,479,940	7,687,037	14,022,582	371,918	24,106,394	1,693,835	76.10	13,681,971	8,817,071	3,931,029
Central New England	1,993	63,981,515	11,998,880	75,980,395	13,715,562	2,170,512	5,510	1,109,949	11,344	74.70	170,410	144,595	125,881	189,291
Central New England	6 mos.	295	3,804,367	77,306	4,013,618	636,942	762,572	30,360	1,360,588	67,930	71.20	1,155,226	1,000,804	817,011
New York Connecting	1,986	1,076,658	.....	245,165	7,754	13,801	.....	47,218	1,170	28.50	175,192	134,442	97,785	140,189
New York Connecting	6 mos.	20	1,078,284	.....	1,420,556	48,653	85,635	.....	7,838	30.00	994,277	76,677	554,270	172,238
New York, Ontario & Western	1,986	680,862	236,907	1,094,412	175,435	203,547	15,872	455,884	34,372	87.00	208,260	160,256	137,379	172,008
New York, Ontario & Western	6 mos.	569	6,801,862	807,931	5,944,060	787,810	1,213,492	930,200	2,906,598	81.00	721,034	432,525	225,094	50,669
Norfolk & Western	1,986	5,644,318	795,696	6,440,495	1,220,337	1,524,025	89,417	2,221,858	187,866	77.60	1,514,683	839,235	953,862	1,589,249
Norfolk & Western	6 mos.	2,240	34,844,348	4,429,637	45,303,708	7,408,694	11,416,799	511,396	14,862,633	1,018,391	77.60	10,160,460	6,405,754	7,187,119
Norfolk Southern	1,986	802,955	110,572	913,527	107,936	127,432	24,427	306,583	27,822	74.10	208,154	164,455	119,328	112,309
Norfolk Southern	6 mos.	931	4,029,202	595,411	4,901,103	648,330	734,101	147,976	1,913,993	73.90	1,280,059	1,019,506	742,708	591,441
Northern Pacific	1,986	4,974,799	1,402,644	7,131,414	1,333,964	1,797,969	198,917	2,567,196	224,800	86.90	932,431	269,612	687,632	691,940
Northern Pacific	6 mos.	6,669	31,762,740	6,538,079	42,607,448	6,541,868	10,100,942	1,003,935	16,448,496	1,366,331	87.30	6,935,952	2,860,299	3,202,324
Northern Pacific	6 mos.	496	31,715,555	236,437	617,894	90,974	80,437	9,502	217,166	81.00	201,934	156,570	148,379	398,744
Northern Pacific	6 mos.	496	1,761,196	1,132,972	3,234,007	637,906	560,296	40,609	1,295,475	107,038	594,758	321,783	275,859	398,744
Pennsylvania R. R.	1,986	33,973,865	12,890,573	51,652,768	6,011,309	12,284,748	673,016	12,277,784	1,024,962	80.00	10,846,945	7,582,814	5,771,095	7,926,873
Pennsylvania R. R.	6 mos.	10,508	33,973,865	12,890,573	51,652,768	6,011,309	12,284,748	673,016	12,277,784	80.00	10,846,945	7,582,814	5,771,095	7,926,873
Baltimore, Chesapeake & Atlantic	1,986	215,500,018	72,527,149	315,337,759	31,532,847	79,508,474	3,861,033	126,759,936	8,579,199	94.60	61,111,408	46,635,600	36,739,282	41,434,469
Baltimore, Chesapeake & Atlantic	6 mos.	125	96,917	37,325	140,785	11,337	32,123	2,886	4,082	114.80	7,634	2,719	1,399	27,351
West Jersey & Seashore	1,986	439,453	152,161	617,970	64,147	181,581	83,667	430,867	22,136	70.90	925,398	675,342	403,745	540,077
West Jersey & Seashore	6 mos.	360	2,019,692	3,044,934	5,492,364	862,920	1,126,396	77,337	2,780,904	145,119	5,021,710	242,796	93,522	196,517
Peoria & Pekin Union	1,986	12,005	3,317	18,620	27,956	31,912	1,549	47,430	87,341	70.50	11,260	1,240	23,659	35,247
Peoria & Pekin Union	6 mos.	19	130,650	14,925	91,178	10,476	698,577	5,260	416,883	80.00	2,886,344	2,191,184	1,334,021	1,324,508
Pere Marquette	1,986	2,446,485	405,119	3,136,998	536,018	1,512,881	115,272	2,525,726	80,501	91.00	216,196	107,853	45,570	45,570
Pere Marquette	6 mos.	2,292	16,069,124	2,435,430	20,321,249	2,642,551	4,477,349	314,160	8,033,960	635,993	16,054,311	3,455,365	2,509,107	3,451,811
Pittsburgh & Shawmut	1,986	81,053	3,317	86,920	29,673	31,912	1,549	47,430	87,341	70.50	11,260	1,240	23,659	35,247
Pittsburgh & Shawmut	6 mos.	102	466,520	34,884	514,070	112,832	292,899	9,140	182,183	42,885	67,939	14,617	14,617	203,532
Pittsburgh & West Virginia	1,986	293,190	7,265	333,427	47,201	86,983	6,489	69,307	16,283	71.20	95,012	55,782	120,930	100,091
Pittsburgh & West Virginia	6 mos.	92	1,647,453	52,909	1,907,161	221,364	550,942	27,668	432,275	54,919	1,415,321	264,397	674,489	698,995
Pittsburgh, Shawmut & Northern	1,986	101,765	3,127	108,630	29,673	31,912	1,549	47,430	87,341	70.50	11,260	1,240	23,659	35,247
Pittsburgh, Shawmut & Northern	6 mos.	210	593,795	36,005	657,410	140,940	198,146	9,860	292,400	35,997	676,931	103,000	15,119	13,168
Quincy, Omaha & Kansas City	1,986	48,352	20,019	71,031	33,643	175,361	99,812	260,590	16,902	108.50	43,377	67,263	84,468	149,586
Quincy, Omaha & Kansas City	6 mos.	230	328,349	135,579	513,034	175,361	99,812	260,590	16,902	108.50	43,377	67,263	84,468	149,586
Reading Company	1,986	5,989,517	847,711	7,210,546	994,345	1,717,067	44,791	2,717,907	183,036	78.60	1,613,447	1,274,755	1,337,851	2,932,994
Reading Company	6 mos.	1,148	5,989,517	847,711	7,210,546	994,345	1,717,067	44,791	2,717,907	78.60	1,613,447	1,274,755	1,337,851	2,932,994
Atlantic City	1,986	118,004	292,357	435,579	435,579	435,579	77,159	212,378	10,567	80.00	9,955,297	7,682,255	8,495,562	18,324,973
Atlantic City	6 mos.	169	697,628	1,024,864	1,817,453	602,480	187,686	53,995	1,123,668	31,502	2,001,832	304,388	445,337	286,700
Perkmen	1,986	91,083	6,245	102,780	10,896	5,741	112	41,615	793	57.60	43,587	39,150	32,630	33,115
Perkmen	6 mos.	41	524,250	34,163	581,007	48,948	31,447	650	261,369	4,774	347,402	59,600	181,233	143,966
Port Reading	1,986	135,134	.....	169,079	19,448	10,302	229	58,003	1,539	53.10	79,362	62,973	13,586	26,694
Port Reading	6 mos.	21	777,959	.....	988,961	136,832	42,790	1,374	444,390	13,498	638,880	264,254	8,590	200,695
Rich'd, Fredericksburg & Potomac	1,986	114,868	282,173	1,043,406	103,149	154,157	9,534	341,868	31,695	63.10	384,995	323,574	260,219	307,243
Rich'd, Fredericksburg & Potomac	6 mos.	117	3,095,549	2,162,865	6,283,651	716,341	918,825	55,106	2,076,996	198,544	4,112,281	65,400	1,433,367	1,606,469
Rutland	1,986	289,892	107,680	117,546	107,546	90,374	9,301	204,173	1,248	83.90	529,282	57,646	59,399	67,172
Rutland	6 mos.	413	1,877,578	692,733	3,228,988	580,672	610,694	52,633	1,366,014	80,272	2,699,707	366,098	397,242	415,124
St. Louis-San Francisco	1,986	4,338,327	1,659,392	6,466,888	840,763	1,033,511	103,187	2,235,115	193,511	73.20	1,733,411	1,442,141	1,412,245	1,423,408
St. Louis-San Francisco	6 mos.	4,747	4,338,327	1,659,392	6,466,888	840,763	1,033,511	103,187	2,235,115	73.20	1,733,411	1,442,141	1,412,245	1,423,408
St. Louis-San Francisco	6 mos.	235	94,409	23,687	128,371	21,551	24,436	3,624	55,611	6,604	114,820	9,691	739	12,853
St. Louis-San Francisco	6 mos.	235	516,583	150,523	737,395	123,587	142,841	24,342	346,129	36,137	673,220	40,886	13,697	99,845
Ft. Worth & Rio Grande	1,986	13,681	18,400	126,076	24,410	4,024	65,537	6,255	128,910	87.00	19,190	16,936	5,536	1,303
Ft. Worth & Rio Grande	6 mos.	134	699,255	79,946	821,459	148,319	29,111	331,413	38,704	67.00	149,468	136,442	5,536	98,757
St. Louis, San Francisco & Texas	1,986	989,067	138,209	1,192,724	139,885	254,133	43,424	333,775	54,881	69.70	301,366	301,256	243,695	403,508
St. Louis, San Francisco & Texas	6 mos.	969	989,067	138,209	1,192,724	139,885	254,133	43,424	333,775	69.70	301,366	301,256	243,695	403,508
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
St. Louis, San Francisco & Texas	6 mos.	969	7,313,710	878,129	8,651,991	1,106,004	1,959,444	281,776	2,310,549	350,854	6,093,906	2,191,088	1,759,209	3,050,408
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Revenues and Expenses for June and Six Months' Period

Class I railroads representing a mileage of 235,968 miles, had operating revenues totaling \$465,655,450 in June, according to reports for the month compiled by the Bureau of Railway Economics. This was a decrease of \$75,722,360 or 14 per cent under the same month last year. Operating expenses totaled \$364,173,700 or 12.6 per cent under those for June, 1923.

The net operating income for June amounted to \$65,528,960 compared with \$88,287,500 in June last year, or a decrease of \$22,758,560. In May, 1924, the net operating income was \$60,653,877.

Class I railroads for the first six months this year had a net operating income of \$390,983,855 which was at the annual rate of return of 4.13 per cent on their property investment, compared with \$446,449,700 or 4.94 per cent for the same period last year.

Earnings by districts for the first six months with the percentage of return on property investment on an annual basis in each district follows:

New England region.....	\$15,407,065	3.82 per cent
Great Lakes region.....	80,923,075	5.08 per cent
Central Eastern region.....	82,465,718	4.25 per cent
Poahontas region.....	21,996,304	5.35 per cent
Total Eastern district.....	200,792,162	4.62 per cent
Total Southern district.....	68,215,083	5.25 per cent
Northwestern region.....	27,848,310	2.26 per cent
Central Western region.....	63,552,785	3.60 per cent
Southwestern region.....	30,575,515	3.69 per cent
Total Western district.....	121,976,610	3.19 per cent
United States.....	390,983,855	4.13 per cent

Class I railroads operating at a loss in June totaled 38, of which 14 were in the Eastern, 4 in the Southern and 20 in the Western district. In May, 40 roads had operating deficits.

An interesting feature in connection with the earnings for the first six months this year is the fact that while operating revenues for that period showed a decrease of 7.3 per cent compared with the corresponding period last year due to the decline in traffic, operating expenses also showed a reduction of 7 per cent.

Expenditures for maintenance for the first half of 1924 totaled \$1,024,802,250, a reduction of \$81,412,440 or 7.4 per cent under the same period last year. For the month of June alone, expenses of Class I carriers for maintenance of equipment showed a reduction of \$25,284,300, or 20.3 per cent, compared with the same month last year while there also was a reduction of \$5,753,260 in the amount expended for maintenance of way or 7.5 per cent.

Carriers in the Eastern district had a net operating income in June of \$33,927,300 compared with \$52,906,600 in June last year. Freight traffic in the Eastern district in June, according to incomplete reports, was 23 per cent under the corresponding period last year. Operating revenues of the Eastern carriers totaled \$232,913,800, a decrease of 18.1 per cent under June the year before. Operating expenses totaled \$180,548,400, a decrease of 15.1 per cent under the same month last year. Class I carriers in the Eastern district earned during the first six months this year \$200,792,162 of net operating income compared with \$243,264,500 during the corresponding period last year.

Class I carriers in the Southern district in June had a net operating income of \$8,087,000 compared with \$8,851,000 in June last year. Freight traffic on the Southern roads in June decreased 17 per cent under the same month last year. Operating revenues of the Southern carriers in June totaled \$59,141,380, a decrease of 9.8 per cent under the same month last year, while operating expenses totaled \$47,423,970, a decrease of 9.6 per cent compared with June one year ago. The net operating income for the Class I roads in the Southern district for the first six months this year was \$68,215,083 compared with \$69,916,290 during the same period last year.

Carriers in the Western district had a net operating income in June of \$23,514,570 compared with \$26,529,870 for the same month last year. Freight traffic in the Western district showed a decrease of approximately ten per cent under June, 1923. Operating revenues of the Western carriers totaled \$173,600,230, a decrease of 9.3 per cent under June, 1923, while operating expenses totaled \$136,201,300 or a decrease of 10.2 per cent. Class I carriers in the Western district during the first six months this year had a net operating income of \$121,976,610 compared with \$133,268,900 during the same period one year ago.

Traffic News

The Chicago, Burlington & Quincy has issued a 32-page booklet containing information relating to Colorado and Utah.

The Erie Railroad announces that the rental on its refrigerator cars after August 31 is to be charged for on a basis of mileage operated.

The Conley Tank Car Company announces that it has bought the business and equipment of the Keystone Car and Equipment Company, thereby acquiring 260 standard steel tank cars.

The Death Valley Railroad has applied to the California Railroad Commission for permission to abandon its line which extends from Death Valley Junction, Calif., to Ryan, a distance of 20 miles. The line is operated by the Tonopah & Tidewater.

The Chicago, Milwaukee & St. Paul will reduce its round trip rates to the northwest and the Pacific coast this fall to one fare for the round trip to accommodate home seekers. The return trip time limit will range from 10 to 21 days. Stopovers will be allowed at points west of the Missouri river.

The number of men necessary to be imported into Western Canada this year to help in harvesting the grain crops, is estimated, according to the report of a conference of railroad and government officers at Winnipeg, at 37,000. Half this number, it is expected, can be secured in Eastern Canada. Harvesting will begin in Manitoba about August 20.

W. B. Kellett, freight claim agent of the Ft. Worth & Denver City, at Ft. Worth, Tex., has been appointed chairman of the freight claim division of the American Railway Association, succeeding J. F. Horrigan, deceased. C. H. Dietrick, freight claim agent of the Chicago, Milwaukee & St. Paul, at Chicago, has been appointed first vice-chairman to succeed Mr. Kellett.

The Missouri Pacific is preparing plans for four tours into old Mexico during the winter of 1924 and 1925. Each of the four trips will be personally conducted by railway men familiar with conditions in Mexico and who will perfect arrangements to insure that the tours will cover all points of interest. The first tour will start from Chicago, St. Louis, Mo., and Memphis, Tenn., on November 22. The other trips will start from those points in January, February and March, 1925.

The Southern Railway announces the establishment of a regular through package car for freight from Cincinnati, Ohio, to Havana, Cuba. This will run over the Florida East Coast Railway and the Key West Ferry, which takes cars across the ocean to Havana 100 miles, daily. The schedule from Cincinnati through will be six days, and no extra packing or marine insurance will be required. Regular package cars are run daily to the Southern Railway freight house in Cincinnati from Chicago, Detroit, Niagara Falls and 16 other prominent points in the central states; so that these places now have the benefit of direct shipment to Cuba with only one transfer.

Increased Pier Space on Staten Island in New York Harbor

Twelve large and modern piers, adapted to the use of the largest ocean steamships, built by the City of New York two years ago and remaining idle since that time because of disagreement between the city and the prospective lessees, are now in the way of being utilized, John A. Lynch, president of the Borough of Richmond, having announced that arrangements have been made with shipping interests to make use of the piers at a mutually satisfactory rental under temporary contracts. These piers are on Staten Island at the west side of the bay, five miles south of the Battery, and the city has arranged with the Baltimore & Ohio, operating the only railroad on the island, to at once extend its tracks to a connection with the tracks on the piers.

Commission and Court News

Interstate Commerce Commission

Coal Rates Regulated

Reversing a previous decision in the Ohio-Michigan coal cases, the Interstate Commerce Commission has authorized the Louisville & Nashville and the Chesapeake & Ohio to continue freight rates on coal from mines served by them in the Inner and Outer Crescent districts to Detroit and points taking the same rates, lower than to Jackson, Michigan, and other intermediate points taking the same rates.

Similar authorization was given to the Cincinnati, New Orleans & Texas Pacific on coal from mines served by it in Kentucky and Tennessee. The commission based its action on the necessity for keeping the Cincinnati Northern routes open for the movement of coal to Detroit in order to reduce congestion at the Toledo gateway. By the commission's order the roads are permitted to establish and maintain the same rates via Jackson or Alfordton as apply via Toledo to Detroit and points taking the same rates, but not lower than the present rates via Toledo, while maintaining higher rates to Jackson and other intermediate points taking the same rates, subject to the conditions that the rates to intermediate points shall not be increased and shall in no case exceed the lowest combination.

Personnel of Commissions

Walter M. Splawn of the Railroad Commission of Texas has resigned to become president of the University of Texas.

State Commissions

The Georgia Public Service Commission has notified the Atlanta Terminal Company to appear on August 12 and "show cause, if any it can," why it should not at once rebuild its train shed so as to cure the "most inadequate, unreasonable and unsuited" facilities. The train shed is called the most important one in the south and it is declared that the commission has been trying for three years to get it fixed up so that the passengers will not have their clothing damaged by rain because of the holes in the roof. The Terminal Company has been "promising time after time" to make the repairs, and a year ago its engineers stated under oath that plans were being completed, but the commission "is now convinced that useless and unnecessary delay has been practiced."

Court News

Shippers Cannot Sue Both Purchaser and Railroad

The Alabama Supreme Court holds that where shippers of lumber knew bills of lading were wrongfully issued to a purchaser but accepted his draft and later obtained judgment on it, they abandoned their claim of ownership and could not sue the railroad for wrongful issue of the bill of lading.—Louisville & N. v. Williams (Ala.) 97 So. 817.

Explosion on Industry Siding—

Contract to Indemnify Valid

In an action for damages caused by the explosion of a tank car of casing-head gasoline on a spur track used by plaintiff, the Georgia Court of Appeals holds that contracts between plaintiff and the railroad company requiring the former to indemnify and hold the railroad company harmless from loss or liability for destruction of property by fire or otherwise were not void as against public policy.

The carrier's duty to the consignee is to safely transport and deliver his shipment in good condition. There is no obligation on the carrier to notify the consignee of the dangerous nature of the shipment, or to employ the most approved safety

devices. The consignee is expected to know the contents of his shipment and govern himself accordingly.—Davis v. A. F. Gossett & Sons (Ga. App.) 118 S. E. 773.

N. J. Statute in Crossing Injury of No Effect in N. Y.

New York Supreme Court, New York County, holds that section 36a of New Jersey Railroad Law, providing that the question of contributory negligence in crossing injury cases shall be left to the jury, is not applicable in an action brought in New York State for injuries sustained at a crossing in New Jersey.—Colucci v. L. V., 121 Misc. (N. Y.) 758, 202 N. Y. Supp. 717.

Railroad Loading Records Admissible in Evidence When Duly Authenticated

The Circuit Court of Appeals, Fourth Circuit, holds that railroad records of the loading of its cars from a ship at a seaport terminal, made in the regular course of business and authenticated by a person under whose direction they were made, are admissible in suits between third parties as evidence of the ship from which the cars were loaded without production of the employees who made the entries.—E. I. Du Pont De Nemours & Co. v. Tomlinson, 296 Fed. 634.

Voluntary Exposure to Danger on Tracks Precludes Recovery

The Georgia Supreme Court holds that voluntary exposure to danger by lying or sitting on a track precludes a recovery for homicide in consequence of the negligence of the railroad's employees, in the absence of willful and wanton negligence on the part of the trainmen, although the place where the deceased was lying or sitting on the track was one at which it was the duty of such employees to have anticipated the presence of pedestrians on its tracks, and although the jury would have been authorized to find, under the facts, that the company's employees failed to exercise ordinary care to discover the deceased's exposed condition.—Lowe v. Payne (Ga.) 118 S. E. 924.

Failure to Give Notice of Claim of Loss Within Legal Period

The Iowa Supreme Court holds that a shipper's action against an initial carrier for the loss by fire of a shipment through the negligent failure of the terminal carrier to furnish cars was barred where notice of claim was not given the initial carrier until two years after the loss. Under the federal act, the terminal carrier, the Buffalo & Susquehanna, would be liable over to the defendant. The B. & S. became insolvent a year after the fire, eight months after the expiration of the four months' period for notice specified in the bill of lading, and nine months after the plaintiff had notice of the loss.—J. C. Hubinger Bros. Co. v. Chicago, B. & Q. (Iowa) 195 N. W. 762.

Railroad Erroneously Telling Consignee Freight Has Been Part Paid Cannot Recover

A shipment of wheat originating in Kansas was consigned to Kansas City, reconsigned to Chicago, and again reconsigned to Akron. The Erie erroneously told the last consignee that all freight charges had been paid to Chicago, and on finding out the mistake sued the consignee for the freight not paid. The Circuit Court of Appeals, Sixth Circuit, points out that this is not a case where the shipper and consignee are conclusively presumed to know the tariff rate. The fact that the freight from Kansas City to Chicago had not been paid was not a matter of common knowledge. Affirming judgment for the consignee, the court said: "While the question of legal liability is not free from doubt, the equities are clearly with the consignee, and we are not impressed that the public interest demands such construction of the law as would make the consignee suffer a loss due to the fault, negligence, and misrepresentation of the carrier."

Labor News

On July 25 an order was issued for a close down of the Canadian Pacific Angus shops in Montreal from that date until August 4. The stoppage entailed a lay off of about 3,000 men. It was also announced that main shops of the system on western lines would close down on July 29 and reopen on August 4.

After negotiations lasting about a year the Canadian National and the Canadian Pacific have notified the train service brotherhoods that they had decided to refuse the rates of pay which have gone into force on lines of a similar standing in the United States. The brotherhoods originally asked to be reimbursed for the reduction made some time ago, amounting to more than 12 per cent and the railways conceded 5 per cent. When this became known the Canadian conductors and trainmen revised their request to the companies and there have been extensive negotiations.

The annual convention of the Canadian section Brotherhood of Locomotive Engineers was held in Toronto from July 29 to August 1. W. D. Robb, vice-president of the Canadian National, and Vice-president A. D. MacTier of the Canadian Pacific addressed the convention. The seniority problem arising out of the merging in the C. N. R. system of the Grand Trunk, the Grand Trunk Pacific, the Canadian Northern and the Intercolonial lines was brought to the attention of the delegates, but owing to the fact that the grand executive of the organization was to convene in Toronto again shortly for the purpose of dealing with this matter, the meeting decided to await the final decision of that body.

Labor Board to Test Its Authority

As the result of the refusal of the members of the locomotive brotherhoods to testify before the board at the hearing last week, the United States Railroad Labor Board has determined to invoke the power of the United States courts in efforts to obtain a judicial test of its authority under the Transportation Act. The basis for this action is to be found in Paragraph 6, Section 310, of the act, which reads as follows:

"In case of failure to comply with any subpoena or in case of the contumacy of any witness appearing before the labor board, the board may invoke the aid of any United States district court. Such court may thereupon order the witness to comply with the requirements of such subpoena, or to give evidence touching the matter in question, as the case may be. Any failure to obey such order may be punished by such court as a contempt thereof."

To this end Chairman Hooper went to Washington on August 3 for the purpose of conferring with Attorney General Stone, but owing to the fact that the chairman did not return to Chicago but went to his home in Tennessee, the results of this conference have not been given out. As the case in question was continued until September 8 and most of the board members have left Chicago, no definite action with respect to contempt cases is anticipated during the present month. However, before leaving Chicago, Chairman Hooper issued a statement which indicated that the contempt proceedings would not interfere with or delay the disposition of the controversy of the enginemen and firemen with the western railroads. "The board is not going to permit the contempt proceedings to delay, indefinitely, disposition of the main controversy. If there is anything in the way of increased rates coming to the men and if any modification of rules is reasonably necessary in behalf of the carriers, action should be as prompt as possible. It is our belief that an adjustment will be effected that will be accepted readily by both parties as substantially fair and just and that will receive public approval."

ENGINEERS who are preparing tentative plans and suggestions for new terminal facilities in Montreal for the Canadian National Railways have also under consideration proposals for new head office accommodation. In a general way it is planned that the new station, which must be built to provide for passenger traffic, will also house the general offices in a similar manner to that in which the big building on Windsor street shelters the head office and the main station of the Canadian Pacific.

Foreign Railway News

Second Annual Exhibition of L. & N. E. Posters

The London & North Eastern Railway has recently held in London a second exhibition of posters which it uses in advertising its services and the country it serves. All of the posters were painted by competent artists—many of them famous. The exhibition comprised 55 different posters. In connection with it the company published a small catalog such as are prepared in connection with all art exhibitions. In a foreword in this pamphlet, however, W. M. Teasdale, advertising manager of the company, disclaimed any intention of conducting a "picture show." Instead he declared:

"The London & North Eastern Railway is selling transportation to about 390 million people per annum—it is trying to increase its sales.

"This is not intended to be a picture show—each poster is designed as an advertisement—to catch the eye—the imagination—the pocket—of people of all kinds.

"The L.N.E.R. appreciates its clients and tries to give them the best service and the best inducement to travel. It strives to improve its service and its advertising each year. It is hoped that the advertisements, the designs and the printing will appeal to the users of the L.N.E.R. and the public."

China Notes

PEKING.

Work on the Menghsien extension to the Taokow-Chinghua railroad has finally begun. The contract for this extension was signed four years ago. The construction engineer came to China and began to form his organization. Tenders were opened for certain materials. And then everything stopped due to the inability of the government to get the land which was necessary to form a junction between the old line and the extension. The earthwork is now nearing completion over this disputed section.

On May 5 the first train reached Shenchow, the temporary Yellow river terminus of the Lung-Hai line. The line from the Yellow river to the Grand canal will probably be delivered to the control of the operating forces before the end of the year, but it is doubtful if the Dutch end, the Haichow terminal section, can be finished this year. While General Wu Pei-fu continues to press for the extension of this line westerly, the Ministry of Communications, which represents a different faction of the Chihli party, continues to oppose.

President Tsao Kun is reported to have made overtures of alliance to Chang Tso-lin, among the terms of which is the proposal that Chang shall name the managing director of the entire Peking-Mukden line and that the revenues of the entire line shall be devoted to the financial needs of the line (the interest and installments of the double-track loan by the British & Chinese Corporation are in arrears). This would be equivalent to giving Chang a position "inside" the Great Wall. Chang will probably not accept, but if he does Wu Pei-fu will have to accept the challenge implied. Wu, on the other hand, seems bent on improving his communications and consolidating his position at Loyang, for he is now urging the Ministry of Communications to build one of the projected lines into Szechuan. It will be remembered that the "Old Consortium" has the contract for one of these lines and the Siems-Carey Company holds the other.

At the last shareholders' meeting of the Peking Syndicate it was announced that Major Nathan, director of the Kailan Mining Administration, had accepted a seat on the directorate of the former company, thus forming a combination of sorts between the two large mining enterprises under British management in China. Still more recently it has been announced that Major Nathan has also been appointed to the directorate of the British & Chinese Corporation, thus forming a community of interest between all the British mining and railway interests in China.

The commission appointed to investigate the physical and financial condition of the Kiao-Tsi (Shantung) railway has brought in its report which has been transmitted to the cabinet. The commission finds that the major bridges must all be replaced immediately, the present bridges being made safe for traffic only by

temporary expedients and by considerable obstructions to traffic; that the present 60-lb. rail should be replaced with 85-lb. section as rapidly as finances permit; that short sections of double track must be built within the next seven years; that a train dispatching telephone system should be installed and that additional freight cars are necessary immediately. Passenger stock it finds to be sufficient for several years to come except for two dining cars. Further purchases of locomotives can be postponed for three or four years if proper distribution of power is effected. Altogether the capital improvements for the next fourteen years will require an expenditure of \$33,000,000, or more than three-quarters of the original cost of the line. To meet this need as well as to pay interest and redeem the treasury notes issued in purchase of the line, the commission finds probable revenues to be adequate. It finds that an average annual increase of nine per cent in revenue is probable except for a probable interruption of two years out of the fourteen. By carefully putting necessary capital improvements to the front when appropriating revenue it is believed that a small redemption of treasury notes can be made in 1928, the first year possible under the Washington agreement. The redemption installments must be continued at a gradually increasing rate leaving fully a half to the last four years. However, the commission finds that a reduction in operating ratio is also necessary and points out that while under German management operating ratio was little above 30 and under Japanese management was no more than 58, under the first year of Chinese management it has jumped to 67. However, the reasons for this increase are justifiable, being found in the duplicate staff during the first month of operation, the interruption to traffic caused by the bridge failure during the second month of the year and the extraordinary repairs required by the condition of the property. Specific criticism was made of fuel performance and a strong recommendation for the adoption of a rigid budget system. Following the return of the commission, the Ministry of Communications directed F. H. Clark, adviser on mechanical matters, to proceed to the Kiao-Tsi line to look into the possibilities of getting more mileage out of the locomotives.

Chang Tso-lin, war-lord of the Manchurian provinces, has formed a communications committee at Mukden, with advisory jurisdiction over all matters which usually come under the direction of the Ministry of Communications at Peking. While this would seem to be another stroke breaking the connection between Manchuria and the rest of China, there are other indications that it is not so intended. For example, Chang is not extending the Chaoyang branch of the Peking-Mukden line towards the Chihli border and a considerable degree of co-operation is being practiced between the "inside" and "outside" Wall portions of that line. But in Manchuria lie almost as many miles of line as in all the rest of China combined. The number of locomotives and the aggregate capacity of freight cars are similar, while the revenues earned by lines in Manchuria are in excess of those earned south of the Great Wall. Moreover, the large problems of adjustment with foreign interest now rest in Manchuria. The meeting of government railways with the South Manchurian and Chinese Eastern lines, each with a difference in gage or in coupler height and highly competitive at certain points, brings up questions peculiar to Manchuria. The Ministry of Communications at Peking being powerless to function in Manchuria, the only remedy was to create a similar body within that jurisdiction.

The preliminary treaty between China and Soviet Russia for the time being has no effect upon the Chinese Eastern Railway. The agreement itself would merely substitute the Soviet government for the Russo-Asiatic Bank in the appointing of the board of directors. It also reduces the 7-3 majority necessary for affirmative action by the board to a more workable 6-4. But it leaves the former statutes of the Chinese Eastern still in force until revised by the final conference to be called probably in September. In the meantime Chang Tso-lin has decreed that none of the present Russian staff may be dismissed. Hence the bank representatives will remain in control until the final agreement is signed and put into effect—or until Chang changes his mind.

SOUTH ST. JOHNSVILLE, N. Y., on the West Shore Division of the New York Central is to be discontinued as a regular station, the Public Service Commission having granted the necessary permission on July 29; and the same is true of Dunsbach Ferry between Troy and Schenectady.

Equipment and Supplies

Locomotives

THE NATCHEZ, COLUMBIA & MOBILE has ordered 1 Mikado type locomotive from the American Locomotive Company.

THE F. C. DE HUANCAYO A AYACUCHO, PERU, has ordered from the Baldwin Locomotive Works, 1 Mogul type locomotive.

THE DETROIT-EDISON COMPANY has ordered 1, 6-wheel switching type locomotive from the Baldwin Locomotive Works.

Freight Cars

THE PACIFIC FRUIT EXPRESS is inquiring for 1,000 underframes.

THE UNION RAILROAD is inquiring for 12, 70-ton gondola cars.

AMERICAN REFRIGERATOR TRANSIT COMPANY—See Missouri Pacific.

THE HAVANA CENTRAL is inquiring for 25 cane cars of 15 tons' capacity.

THE UNION CARBIDE COMPANY is inquiring for from 4 to 8 tank cars of 40 tons' capacity.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is inquiring for 250 underframe constructions.

THE CALORIC COMPANY, New York, is inquiring for 10 tank cars of about 7,000 gal. capacity.

THE CENTRAL OF NEW JERSEY is inquiring for from 25 to 30, 30-yard extension side dump cars.

THE MILL POWER SUPPLY COMPANY, Charlotte, N. C., is inquiring for 10 flat cars of 50 tons' capacity.

HACKLEY-SIDEWELL, Mexico City, Mexico, is inquiring through the car builders for 40 flat cars of 40 tons' capacity.

THE TRI-STATE REFINING COMPANY, Huntington, W. Va., has ordered 6 tank cars of 8,050 gal. capacity from the Standard Tank Car Company.

THE SEABOARD AIR LINE, reported in the *Railway Age* of July 5 as inquiring for 10 caboose cars, has ordered this equipment from the American Car & Foundry Co.

THE NATIONAL REFINING COMPANY, Cleveland, Ohio, has ordered 16 car tanks from the Standard Tank Car Company. The National Refining Company will build the underframes in its own shops.

W. R. GRACE & Co., New York, are inquiring through the car builders for 80 low side gondola cars and 24 tank cars of 6,500 gal. capacity. These cars are for export to the Ferro Carril de Iquique a Pintados, Chile.

THE SIAM STATE RAILWAYS are inquiring through the car builders for 50 covered goods wagons, 50 open high side cars, 75 hopper cars, and 25 bogie high side wagons. Mom Chow Chalart, acting commissioner general of the Siam State Railways, Bangkok, Siam, is asking for bids until October 31, for the supply of all steel goods wagons and is also asking for separate bids on the same date for the supply of wheels and axles. Specifications and drawings are on file with C. P. Sandberg, 100 Broadway, New York City.

THE MISSOURI PACIFIC, reported in the *Railway Age* of June 14 as inquiring for 1,000, 40-ton auto box cars and for 1,500 refrigerator cars, has ordered 500 box cars from the Standard Tank Car Company, 250 from the General American Car Company, and 250 from the American Car & Foundry Co. Orders have also been placed for refrigerator cars for the American Refrigerator Transit Company as follows: For 775 cars to the American Car & Foundry Co., 725 to the Mt. Vernon Car Manufacturing Company, and 500 to the General American Car Company.

Passenger Cars

THE MISSOURI PACIFIC is inquiring for 50 express refrigerator cars.

THE SEABOARD AIR LINE, reported in the *Railway Age* of July 5 as inquiring for 6 combination passenger and baggage cars, 6 combination mail and baggage cars and 6 express cars, has ordered this equipment from the American Car & Foundry Company.

Iron and Steel

THE CANADIAN NATIONAL is inquiring for 10,000 tons of rail.

THE NEW YORK CENTRAL is inquiring for 400 tons of steel for repair work on bridges.

THE WESTERN MARYLAND is inquiring for 900 tons of steel for a bridge in West Virginia.

THE PENNSYLVANIA RAILROAD is inquiring for 300 tons of steel for a bridge in Pennsylvania.

THE CENTRAL OF NEW JERSEY is inquiring for 250 tons of steel for a highway bridge at Morgan, N. J.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 5,000 tons of rails from the Illinois Steel Company.

THE GREAT NORTHERN has given a contract to the American Bridge Company for 2,400 tons of bridge steel.

THE SOUTHERN RAILWAY has ordered 12,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE CUBA RAILROAD has given an order to the United States Steel Corporation for 3,000 tons of 75 lb. open hearth rail.

Machinery and Tools

THE ILLINOIS CENTRAL has placed an order for a 90-inch locomotive axle journal turning lathe.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for one 400-ton hydraulic car wheel press.

THE NEW YORK CENTRAL is asking for prices on a 14-in. U. S. sensitive floor drill with center shaft for the Peoria & Eastern.

MITSUMI & COMPANY, NEW YORK, reported in the *Railway Age* of June 28 as inquiring for a large number of machine tools, has ordered two large boring mills from the Betts Machine Company, also several small boring mills from the Bullard Machine Tool Company and several milling machines from the Cincinnati Milling Machine Company. Contracts for additional machinery will be let in the near future.

Track Specialties

THE GREAT NORTHERN is inquiring for 3,000 kegs of $\frac{5}{8}$ by 6 in. track spikes.

THE ILLINOIS CENTRAL has ordered 4,000 tons of tie plates from the Sellers Manufacturing Company.

THE LOUISVILLE & NASHVILLE has ordered 9,500 kegs of spikes from the Illinois Steel Company and 1,650 pairs of angle bars from the Inland Steel Company.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of August 2 as inquiring for 12,000 kegs of spikes and 850 kegs of bolts and a quantity of bars, has ordered 9,500 kegs of spikes from the Illinois Steel Company, 200 kegs of bolts from the Bourne-Fuller Company and 1,650 pairs of anglebars from the Inland Steel Company.

Signaling

THE DELAWARE, LACKAWANNA & WESTERN has ordered from the Union Switch and Signal Company 71 Style "HC-2" flashing color light signals for installation at highway grade crossings on their line.

Supply Trade News

Brinton Welser, assistant secretary and assistant sales manager of the Chain Belt Company, Chicago, has been elected secretary.

Fairbanks, Morse & Company, Chicago, contemplates the erection of a branch plant at Los Angeles, Calif., estimated to cost \$1,000,000 with equipment.

Theodore B. Counselman has been appointed western representative of the Clark Car Company, Pittsburgh, Pa. Mr. Counselman has his headquarters at 122 South Michigan avenue, Chicago.

D. A. Clements has been appointed representative of the Gibb Instrument Company, Bay City, Mich., to represent this company in Missouri and southern Illinois, with headquarters at 4167 Washington avenue, St. Louis, Mo.

The Hanna Engineering Works, 1765 Elston avenue, Chicago, is now represented in Maine, New Hampshire, Vermont, Massachusetts and Rhode Island by the Eggleston Supply Company, 259 Franklin street, Boston, Mass.

Fred A. Meckert, formerly general manager of the Fort Pitt Spring & Manufacturing Co., and since last April, president of the Mitchell Spring & Manufacturing Co., Johnstown, Pa., resigned on August 1, on account of ill health and is now in San Francisco, Cal. Mr. Meckert on his recovery expects to re-enter the same line of business.

The Massey Concrete Products Corporation, Chicago, has sold to the Westinghouse Electric & Manufacturing Company its entire interest in the manufacture and sale of Hollowspun concrete posts and poles including its plant at Milwaukee. This department was confined to the Milwaukee plant exclusively and its sale in no way affects the activities of the Massey Company in its other twelve plants.

D. R. Arnold, sales manager of the Canadian Car & Foundry Company, Montreal, Que., has been appointed vice-president of the Union Metal Products Company, with headquarters at Chicago. He was born in Dayton, Ohio, and in 1906 entered the employ of the Barney & Smith Car Company, Dayton, Ohio, where he held various positions. In 1911 he resigned from the sales department to become assistant to the chief engineer of the Canadian Car & Foundry Company and in 1914 was transferred to the sales department. In 1916 he was appointed sales manager, which position he has held until his recent appointment.

The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has made a number of changes in its sales organization, dividing the company's products into two general classes, engineering and merchandising. T. D. Montgomery, formerly manager of the eastern district, with headquarters at New York, has been appointed assistant sales manager in charge of engineering sales. He is now located at the main office in Milwaukee. A. H. Fleet, formerly manager of the specialty department at Milwaukee, now has charge of the sale of all merchandising products of the company. C. W. Yerger, formerly manager of the Boston office, is now manager of the eastern district, assuming the former duties of Mr. Montgomery. J. M. Fernald succeeds Mr. Yerger as manager of the Boston office. A Milwaukee branch sales office has been opened in charge of J. U. Heuser, formerly of the Chicago office of the company. This Milwaukee branch office is part of the district including Detroit, St. Louis and Chicago, the latter being the main office, of which H. L. Dawson is manager.

WILLIAM R. MORGAN, station master of the Chicago & North Western Terminal in Chicago, retired on July 17 after 56 years and 4 months of railway service. He was presented with a radio set by his associates upon his retirement.

Railway Construction

AMERICAN RAILWAY EXPRESS.—This company is asking for bids on a one-story brick express building at Dennison, Ohio.

ATCHISON, TOPEKA & SANTA FE.—This company has been ordered by the California Railroad Commission to construct a subway at Franklin canyon road near Christie, Calif., in Contra Costa county, at an estimated cost of \$88,701, which will be shared equally by the county and the railroad.

ATCHISON, TOPEKA & SANTA FE.—The Railroad Commission of California has approved plans for the construction of a viaduct over Macy street, Los Angeles, Calif., and has ordered the county of Los Angeles, the city of Los Angeles, the Atchison, Topeka & Santa Fe, the Union Pacific and the Los Angeles Railways Corporation to proceed with the construction work called for by the plans.

BALTIMORE & OHIO.—This company has awarded to the Chicago Bridge & Iron Works a contract for building a water softening tank 32 ft. in diameter by 46 ft. high to be erected at Bridgeport, Ohio.

BALTIMORE & OHIO.—This company has awarded a contract to the Ferro Construction Company, Chicago, covering the erection of superstructures for three bridges on its Ohio division between Parkersburg and Cincinnati. One of these bridges, crossing the Scioto river near Chillicothe, consists of five through-truss spans, 153 ft. long. The other two bridges consist of plate girder spans, varying in length from 57 to 140 ft. Approximately 1,950 tons of new steelwork is involved. A contract placed with the Kelly-Atkinson Construction Company covers erection of superstructure of bridge crossing the North river, Mt. Crawford, Va. The new bridge consists of 4 plate girder spans, 75 ft. long, and replaces two 147-ft. Whipple truss spans, constructed in 1872. Approximately 210 tons of new steelwork is involved.

BALTIMORE & OHIO.—This company is asking for bids for the installation of pipe lines and machinery for a water treating plant at Ottawa, Ohio.

CANADIAN NATIONAL.—Arrangements are being made by this company for the immediate laying of steel on the line from St. Rose du Lac to Rorketon, Manitoba, most of which was graded some years ago. The railway will be 22 miles in length.

CHESAPEAKE & OHIO.—This company is preparing plans for a 500,000-gal. steel water treating plant at Russell, Ky., to cost \$65,000.

CHICAGO, BURLINGTON & QUINCY.—This company and the Colorado & Southern have agreed to enlarge, improve and consolidate their freight yards at Denver, Colo., the work to cost about \$300,000.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has purchased a tract of land between Highwood, Minn., and the Mississippi river, on which it is planned to locate shops, a roundhouse for locomotives working out of this territory and a freight distribution yard.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is making surveys for a new line between Trenton, Mo., and Kansas City, with a view to securing lower grades.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, in conjunction with the Union Pacific, the Kansas City Terminal and the city commissioners, is planning the construction of a 3,000 ft. viaduct at Kansas City, Kans.

CHICAGO UNION STATION COMPANY.—This company will open bids on August 18 for the erection of train sheds. This company will soon accept bids on the construction of the Roosevelt Road viaduct, Chicago.

COLORADO, COLUMBUS & MEXICAN.—This company has applied to the Interstate Commerce Commission for permission to con-

struct 200 miles of line from Farmington, New Mex., to Grand Junction, Colo.

COLORADO, COLUMBUS & MEXICAN.—This company has applied for authority from the Interstate Commerce Commission to construct a part of its projected line. It would commence construction immediately of a 200 mile section from Farmington, N. M., to Grand Junction, Colo. Should application of the company now pending before the commission be granted, this line would be an extension of the line from Farmington to Gallup.

DETROIT & IRONTON.—This company has been authorized by the Interstate Commerce Commission to construct a cut-off extending from a connection with the Detroit, Toledo & Ironton at Malinta, Ohio, to a connection with the Ironton at Durban, Mich., a distance of approximately 55 miles. The cost of the line is estimated at \$8,420,000, including the acquisition of the right-of-way.

ELGIN, JOLIET & EASTERN.—This company has awarded a contract to the Howlett Construction Company, Moline, Ill., for the coal handling equipment for its new powerhouse at Joliet, Ill.

ERIE.—This company has awarded a general contract to Bates & Rogers, Chicago, for the erection of a structural steel and brick powerhouse 100 by 60 ft., at Jersey City, N. J.

GRAND TRUNK WESTERN.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of a 500-ton concrete coaling station at Battle Creek, Mich.; a 350-ton concrete coaling station at Durand, Mich., and a 300-ton concrete coaling station at Grand Haven, Mich.

LOUISVILLE & NASHVILLE.—This company, which was reported in the *Railway Age* of July 19 as asking for bids for the construction of a machine shop and a smith shop at Corbin, Ky., has awarded a contract for this work to Roehl & Corbin, Knoxville, Tenn.

LOUISVILLE & NASHVILLE.—This company, reported in the *Railway Age* of July 26 as preparing plans for the construction of a brick passenger station at Bowling Green, Ky., to cost approximately \$200,000, is now asking for bids.

MISSOURI PACIFIC.—This company has announced its intention to the Louisiana Public Service Commission to build a line from Epps in West Carroll Parish, Ark., to Eudora, a distance of 12 miles.

MOTLEY COUNTY RAILROAD.—This company has applied to the Interstate Commerce Commission for permission to extend its line 125 miles, from Spur, Tex., to Memphis.

PORTLAND TERMINAL.—This company will with its own forces reconstruct platforms and rearrange the tracks at its terminal freight house in Portland, Me. The work will cost approximately \$103,000.

RICHMOND, FREDERICKSBURG & POTOMAC.—This company will replace a 1,700-ft. wooden trestle over Quantico creek with a steel and concrete structure. The steel, 1,500 tons, has been ordered from the American Bridge Company and the construction will be done by company forces.

ST. LOUIS-SAN FRANCISCO.—This company has prepared plans for a brick and concrete passenger station at Fayetteville, Ark., to cost approximately \$100,000.

SIoux CITY TERMINAL.—This company has under construction a six-stall enginehouse and machine shop of reinforced concrete and brick construction, at an approximate cost of \$100,000.

THE NATIONAL TERMINALS CORPORATION.—This company of Indianapolis, Indiana, is contemplating the construction of a terminal warehouse in Chicago and has prepared plans for the construction of a terminal warehouse at St. Louis, Missouri.

VIRGINIAN.—This company has awarded to the Chicago Bridge & Iron Works a contract for furnishing and erecting a 100,000-gal. tank on a 100-ft. tower at Sewalls Point, Va.

THE SHOPS of the Delaware & Hudson at Colonie, N. Y., report that from April 21 to August 4 the 1,000 employees in the shops worked 1,000,000 hours without a man being hurt.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control by lease of the line of the Oklahoma Central which it has operated since 1914. The Oklahoma Central extends from Chickasha to Lehigh, Okla., a distance of 135 miles, connecting with the Santa Fe at Byars Junction. Applicant represented that unified operation will be more economical.

BONHOMIE & HATTIESBURG SOUTHERN.—Acquisition.—This company has been conditionally authorized to acquire and operate the Natchez branch of the Gulf, Mobile & Northern. The commission's order is based upon the condition that the applicant shall enter into an agreement with the Mississippi Central granting the latter the right to operate through trains over the line between Hattiesburg and Beaumont on just and reasonable terms. The Mississippi Central also will be permitted to solicit business at Hattiesburg for movement over the applicant's line to destinations beyond Beaumont or for delivery to the Gulf at Beaumont for further shipment. The Gulf is required to enter into an agreement with the Mississippi Central granting to that road trackage rights between Beaumont and Mobile on reasonable terms for a period not less than five years to enable the Mississippi Central to demonstrate the benefits of its so-called Natchez route.

BOSTON & MAINE.—Stockholders' Claims.—See New York, New Haven & Hartford.

BOSTON & MAINE.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon operation and the facilities of the Suncock Valley Railroad extending from Allenstown, 17 miles to Pittsfield, N. H., and also the Suncock Valley Extension Branch, extending from Pittsfield to Center Barnstead, a distance of 4½ miles. Neither line is in receivership but applicant states that the demand for service is so small that their operation for many years has resulted in losses. The Suncock Valley is leased by applicant and with termination of the lease the lessor must again operate the line until it obtains relief.

CHICAGO GREAT WESTERN.—Asks Authority to Issue Bonds.—This company has requested authority from the Interstate Commerce Commission nominally to issue \$2,000,000 of its first mortgage 4 per cent gold bonds in reimbursement of money expended from income for the period August 1, 1921, to September 30, 1922, and not yet capitalized. The bonds are dated September 1, 1909, and mature September 1, 1959.

CHICAGO & NORTH WESTERN.—Dividends in 1923.—Dividends on the common stock for the year 1923 totaled 4 per cent, instead of 3 per cent, as was incorrectly stated in the *Railway Age*, of July 12, 1924, page 67.

DELAWARE & HUDSON.—Bonds.—This company has requested authority from the Interstate Commerce Commission to issue \$4,600,000 of first and refunding mortgage 4 per cent gold bonds dated May 1, 1908 and maturing May 1, 1943 for the purpose of retiring \$500,000 of first mortgage 6 per cent bonds of the Schenectady & Duaneburgh Railroad, maturing September 1, next and to reimburse its treasury to the extent of \$4,100,000 for additions and betterments. The company does not intend to sell the bonds at the present time, stating in its application that the present condition of the bond market is not advantageous.

DETROIT & IRONTON.—Bonds.—The Interstate Commerce Commission has authorized this company to issue \$75,000,000 of first mortgage 5 per cent gold bonds, series A, to be sold at par. The funds are to be used for construction work.

ENSLEY SOUTHERN.—To Salvage Line.—A. B. Aldridge, receiver for this railroad, has been authorized by the Chancery Court to tear up the track between Birmingham and Maxine, four miles, and to sell the salvaged material. The gross value of the materials is estimated at \$34,752; salvage costs, \$16,630. Permission was given by the State Public Service Commission recently for the discontinuance of trains on this section of the road.

GEORGIA.—Six Months' Guaranty.—The Interstate Commerce Commission has issued a final certificate placing the amount of this company's guaranty for the six months' period following expiration of federal control at \$462,223, of which \$48,223 was still to be paid on the final certificate.

LEHIGH VALLEY.—Bonds Sold.—Drexel & Co., Philadelphia, and the First National Bank, New York, have sold at 99½ and interest, to yield more than 5 per cent, \$12,000,000 general consolidated mortgage 5 per cent bonds not redeemable prior to maturity, May 1, 2003. The proceeds of the new financing will be applied toward the redemption of \$15,000,000 10-year 6 per cent collateral trust gold bonds of the company.

LOUISIANA & SOUTHERN.—Tentative Valuation.—The Interstate Commerce Commission has served a tentative valuation report as of June 30, 1918, placing the final value for rate-making purposes of the property owned, but leased to the New Orleans, Texas & Mexico, at \$800,000. The outstanding capitalization as of the valuation date was \$2,000,000 and the book investment in road and equipment was \$1,108,831, which the report readjusts to \$1,035,192. The cost of reproduction new of the company's property is reported as \$901,047, and cost of reproduction less depreciation as \$643,294.

MINNEAPOLIS & ST. LOUIS.—Annual Report.—The annual report for the year ended December 31, 1923, shows a net deficit of \$1,212,105 as compared with a net deficit of \$1,161,924 in 1922. The income account compares as follows:

	1923	1922	Increase or Decrease
Average miles of road operated....	1,650	1,650	.....
Gross operating revenues.....	\$16,524,961	\$15,558,248	\$966,713
Operating expenses.....	14,288,791	13,337,709	951,082
Taxes (other than U. S. Govt.)....	788,757	823,867	—35,110
Operating revenues over expenses and taxes.....	1,447,412	1,396,672	50,741
Total other income.....	178,195	67,627	110,568
Surplus.....	1,625,607	1,464,299	161,308
Total fixed and other charges.....	2,837,712	2,626,223	211,490
Balance—Surplus.....	Def. 1,212,105	Def. 1,161,924	—50,181

NEW YORK CENTRAL.—Excess Income Reports.—The Interstate Commerce Commission has announced a hearing to be held on September 24 at Washington before Director Mahaffie to determine whether the lines included in the consolidated reports of excess income for 1920, 1921, 1922, and 1923 were, during those respective periods, under common control and management and operated as a single system, within the meaning of paragraph 6, Section 15a.

NEW YORK, NEW HAVEN & HARTFORD.—B. & M. Board.—Elbridge R. Anderson, appointed as master by the Massachusetts Supreme Court, states that the New Haven is not seeking control of the Boston & Maine, but wishes proportionate representation on its board of directors in order to safeguard its interests. Mr. Anderson has been hearing the facts in a suit brought by Edmund D. Codman, representing minority stockholders of the Boston & Maine, who alleged that the New Haven was acting in violation of the law in trying to obtain representation on the Boston & Maine Board. In his finding Mr. Anderson says the New Haven officers believed that as they were the indirect holders of 28 3-10 per cent of the Boston & Maine stock they had a right to proportionate representation on the board in order to see that this interest was not depleted, and, if possible, to aid in devising means to assist in increasing Boston & Maine revenues.

A bill in equity has been filed by Edward F. Brown of Ipswich, Mass., against the New York, New Haven & Hartford, the Boston Holding Company, J. Pierpont Morgan and many others, to recover injuries alleged to have been sustained by the corporation of which he is a stockholder. He alleges that the Boston & Maine has been injured to the extent of one hundred million dollars, and that the stockholders have suffered a like loss.

OSAGE.—Stock.—This company has been authorized by the Interstate Commerce Commission to issue 2,558 shares of capital stock to be sold at not less than \$100 par and the proceeds used to reimburse the applicant for capital expenditures heretofore made.

RICHMOND, FREDERICKSBURG & POTOMAC.—Tentative Valuation.—The Interstate Commerce Commission has served a tentative valuation report as of June 30, 1916, placing the final value for rate-making purposes of the property owned at \$11,189,700 and that of the property used at \$11,384,700. The outstanding capitalization as

of valuation date was \$8,597,400 and the book investment in road and equipment was \$8,920,658, which the report readjusts to \$8,747,313. The cost of reproduction new of the used property is reported as \$10,538,170 and the cost of reproduction less depreciation as \$8,455,944.

ROCK ISLAND.—Abandonment.—This company has requested permission from the Interstate Commerce Commission to abandon a line from West Davenport to Stockton, Iowa, 16 miles in length. Carrier represents that the territory served will be able to use the facilities of its main line on the north, by its line extending from Davenport to Muscatine and by the line of the Davenport & Muscatine Railway on the south.

VIRGINIAN.—Bonds.—This company has been authorized to procure authentication and delivery of \$3,133,000 of its first mortgage 50-year bonds and to sell \$10,000,000 of that class of bonds at 93 and accrued interest to the National City Company of New York and Lee, Higginson & Co. See also Virginian Terminal, item below.

VIRGINIAN TERMINAL.—Bonds.—This company has been authorized to issue \$1,109,000 of first mortgage 5 per cent 50-year bonds to be delivered to the Virginian Railway to reimburse the latter for advances made to the terminal company. The Virginian has been authorized to assume obligation and liability as guarantor of the terminal bonds, to pledge them with the trustee of its first mortgage, dated May 1, 1912, and to procure authentication and delivery of a like amount of its own first mortgage 50-year bonds.

WYOMING NORTH & SOUTH.—Receivership.—This company and the North & South were placed in the hands of receivers by Judge James H. Burgess in the district court at Buffalo, Wyo., on July 31. Charles S. Hill, vice-president of the North & South and E. C. Fenstermaker, chief engineer, were appointed receivers. The receivership was granted to satisfy a claim of \$53,000 of the Cloud Peak Timber Company. Bonds totaling \$100,000 were posted in order to complete the road. This road is under construction between a point on the Chicago, Milwaukee & St. Paul at Miles City, Mont., to Castro, Wyo., a distance of approximately 320 miles. The line from Casper, Wyo., to Salt Creek was opened for traffic on September 15, 1923.

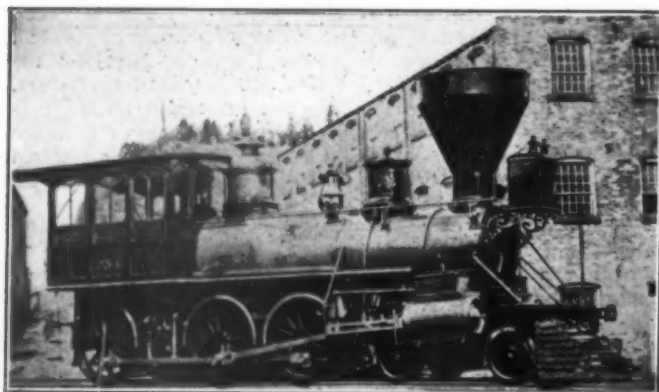
Dividends Declared

Buffalo, Rochester & Pittsburgh.—Common, 2 per cent, semi-annually; preferred, 3 per cent, semi-annually; both payable August 15 to holders of record August 9.

New York, Chicago & St. Louis.—Common, 1½ per cent, quarterly; preferred, 1½ per cent, quarterly; both payable October 1 to holders of record August 15.

Trend of Railway Stock and Bond Prices

	Aug. 5	Last Week	Last Year
Average price of 20 representative railway stocks	71.16	71.54	58.89
Average price of 20 representative railway bonds	88.73	89.03	82.18



A Pennsylvania Locomotive of 1862

Railway Officers

Executive

M. Marlatt has been appointed vice-president and general manager of the St. Louis, Troy & Eastern, with headquarters at St. Louis, Mo.

G. D. Brooke, superintendent of transportation of the Baltimore & Ohio lines west, with headquarters at Cincinnati, Ohio, has been appointed assistant to the vice-president of operation of the Chesapeake & Ohio, with headquarters at Richmond, Va., effective August 1. He was born on September 15, 1878, at Sutherlin, Va., and graduated from Virginia Military Institute in 1900. He entered railway service on July 17, 1902, as a rodman on the Baltimore & Ohio. From August, 1902, to December, he was a levelman and from December, 1902, to May, 1904, he was a transitman. On the latter date he was promoted to assistant engineer in charge of a field party, which position he held until March, 1905, when he was made assistant engineer in charge of location surveys at Cumberland, Md. In July, 1908, he was promoted to assistant division engineer, with headquarters at Pittsburgh, Pa., which position he held until July, 1909, when he was made division engineer, with headquarters at Baltimore, Md. From March, 1911, to February, 1912, he was assistant engineer in the operating department and from February, 1912, to September, 1912, he was assistant superintendent at Keyser, W. Va. In September, 1912, he was promoted to superintendent of the Shenandoah division at Winchester, Va., which position he held until April, 1914, when he was transferred to the Ohio division at Chillicothe, Ohio. In October, 1916, he was transferred to the Cumberland division at Cumberland, Md., and from May, 1918, to July, 1918, he was a special representative of the transportation department at Baltimore, Md. He entered the United States Railroad Administration in July, 1918, as supervisor in the operating division at Philadelphia, Pa., which position he held until March, 1919, when he returned to the Baltimore & Ohio, as superintendent of transportation of the Western lines at Cincinnati, Ohio, which position he has held until his recent appointment.



G. D. Brooke

Financial, Legal and Accounting

P. J. Stock has been appointed general accountant of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn.

Thomas W. Fister, assistant general claim agent of the Philadelphia & Reading, with headquarters at Philadelphia, Pa., has been appointed district claim agent, with headquarters at Reading, Pa. **F. W. Fleck** has been appointed assistant to the general claim agent, with headquarters at Philadelphia.

J. E. Westlake, right-of-way agent of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been promoted to assistant real estate agent, with the same headquarters, and will take over the duties of **C. G. Sturtevant**, tax commissioner and assistant real estate agent, who will devote his entire time to tax matters.

Benjamin I. Spock, whose appointment as general counsel of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., was announced in the *Railway Age* of July 19, was born on December 31, 1872, at New Haven, and was graduated from Yale College in 1895 and from Yale Law School in 1897. He entered railway service in September, 1903, with the New York, New Haven & Hartford as a claims attorney and later served as general solicitor. For the last six years Mr. Spock was connected with the Chase Company of Waterbury, Conn., as general counsel.

Louis J. Richard, district claim agent of the Pennsylvania, with headquarters at Indianapolis, Ind., has been promoted to assistant chief claim agent, with headquarters at Pittsburgh, Pa., and will be succeeded by **Ralph R. Miller**. **Charles H. Haberstroh**, acting claim agent, with headquarters at Ft. Wayne, Ind., has been promoted to district claim agent, with the same headquarters, succeeding **Carl J. Burlage**, who has been transferred to Buffalo, N. Y. **George B. Jansen**, of the claim department at Ft. Wayne, Ind., has been appointed district claim agent, with headquarters at Canton, Ohio.

Operating

W. A. Ray has been appointed acting assistant trainmaster of the Pennsylvania, with headquarters at Detroit, Mich., to succeed **B. A. Frazier**, transferred.

William N. Neff has been appointed superintendent of the Pueblo division of the Denver & Rio Grande Western, with headquarters at Pueblo, Colo., to succeed **C. E. Leverich**, resigned.

James A. Seeley, special clerk of the Atchison, Topeka & Santa Fe, with headquarters at Chillicothe, Ill., has been promoted to transportation inspector of the Illinois division, with the same headquarters.

Arthur Van Brown, acting general manager of the Northern Pacific lines west of Paradise, with headquarters at Seattle, Wash., has been promoted to general manager to succeed **Edwin P. Blanchard**, retired.

James Clark, trainmaster of the Winnipeg Terminal division of the Canadian National, with headquarters at Winnipeg, Man., has been promoted to assistant superintendent, with headquarters at Mirror, Alta.

Fred Meyers, superintendent of the Union Belt of the Wabash, with headquarters at Detroit, Mich., has been transferred to Chicago as superintendent of the Chicago Terminal division, to succeed **H. Eicke**, retired.

J. A. Caviezel, assistant general manager of the Alabama, Tennessee & Northern, with headquarters at Mobile, Ala., has been promoted to general manager, with the same headquarters. The position of assistant general manager has been abolished.

W. H. McBean, assistant superintendent of the Tucson division of the Southern Pacific, with headquarters at Tucson, Ariz., has been transferred to the Portland division, with headquarters at Roseburg, Ore., to succeed **D. S. Weir**, who has been transferred to the San Joaquin division, with headquarters at Bakersfield, Calif., where he will succeed **J. C. Goodfellow**, who has been transferred to the Tucson division, with headquarters at Tucson, Ariz., in place of **W. H. McBean**.

J. Harry Hughes, whose promotion to superintendent of the Ottawa division of the Canadian Pacific, with headquarters at Ottawa, Ont., was announced in the *Railway Age* of July 12, entered railway service in 1885 as a brakeman on the Intercolonial. In August of the following year he entered the service of the Canadian as a freight brakeman at North Bay, Ont., and two years later became a freight conductor. In August, 1890, he became a passenger conductor, holding that position until April, 1902, when he was appointed instructor of new rules. He became trainmaster on October 1 of the same year, with headquarters at North Bay, and on May 1, 1907, he was promoted to assistant superintendent, with the same headquarters. On May 6, 1911, he was promoted to superintendent,

with headquarters at White River, Ont., and in August, 1912, he was appointed assistant superintendent at Smith's Falls, Ont. Mr. Hughes was transferred to Ottawa, Ont., in the same capacity, on September 29, 1915, the position he held at the time of his promotion to superintendent.

Traffic

R. A. Yelton has been appointed general agent of the Virginian, with headquarters at Chicago, Ill.

Lee A. Dwelle has been appointed general agent of the Erie, with headquarters at Los Angeles, Cal.

Nicholas C. Frick has been appointed commercial agent of the Erie, with headquarters at Los Angeles, Calif.

H. H. Schutt has been appointed general agent of the Boston & Maine, with headquarters at Memphis, Tenn.

Warren Brown has been appointed general agent of the Gulf & Ship Island, with headquarters at Memphis, Tenn.

L. F. Moore has been appointed general traffic agent of the Missouri & North Arkansas, with headquarters at Chicago.

L. F. McFarland has been appointed commercial agent of the Chesapeake & Ohio, with headquarters at Toledo, Ohio.

C. F. Beach has been appointed general agent of the New Orleans Great Northern, with headquarters at Detroit, Mich.

H. W. Stigler has been appointed general agent of the Chicago, Attica & Southern, with headquarters at Memphis, Tenn.

M. M. Goodsell has been appointed assistant general passenger agent of the Northern Pacific, with headquarters at St. Paul, Minn.

C. A. Reed has been appointed general southwestern agent of the Belt Railway Company of Chicago, with headquarters at Kansas City, Mo.

C. H. Wilson has been appointed assistant general freight agent of the San Antonio & Aransas Pass, with headquarters at San Antonio, Tex.

H. G. Best has been appointed general agent of the Denver & Rio Grande Western, with headquarters at Trinidad, Colo., to succeed **R. L. Brown**.

Willard P. Kromphardt, commercial agent of the Erie, with headquarters at Peoria, Ill., has been promoted to general agent, with the same headquarters.

J. H. Becker, city freight agent of the Michigan Central, with headquarters at Windsor, Ont., has been promoted to general agent, with the same headquarters.

F. M. Schnell, city passenger agent of the Great Northern, with headquarters at New York, has been promoted to district passenger agent, with the same headquarters.

H. L. Blackstone has been appointed general agent of the Minneapolis, Northfield & Southern, with headquarters at San Francisco, Calif., to succeed **George A. Davis**.

James W. Abell, commercial agent of the Belt Railway Company of Chicago, with headquarters at Chicago, has been promoted to general agent, with the same headquarters.

L. M. Jones has been appointed superintendent of sleeping and dining cars of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, succeeding **F. W. Getty**, resigned.

E. J. Carland, division freight and passenger agent of the Chicago & North Western, with headquarters at Omaha, Neb., has been appointed general agent, with headquarters at Kansas City, Mo.

G. H. Pain, superintendent of the Kansas, Oklahoma & Gulf of Texas, with headquarters at Denison, Tex., has been appointed auditor, treasurer and general agent, with the same headquarters.

C. A. Redden, division freight agent of the St. Louis-San Francisco, with headquarters at Wichita, Kans., has been appointed division freight and passenger agent, with the same headquarters.

G. H. McHugh, division freight agent of the New York, Chicago & St. Louis, with headquarters at Peoria, Ill., has been appointed division freight and passenger agent, with the same headquarters.

Hiram M. Pearce, general traffic manager of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., has retired after 43 years of service and the position of general traffic manager has been abolished.

Dewitt Foster, former superintendent of the colonization and development department of the Canadian National, has become director of the railway advertising department of the Vanderhoof & Company advertising agency.

Edgar F. Woode, general baggage agent of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., has retired after 52 years of service and the position of general baggage agent has been abolished.

R. C. Kerr, general agent of the Chicago & North Western, with headquarters at Milwaukee, Wis., has been promoted to division freight and passenger agent, with headquarters at Green Bay, Wis., to succeed H. B. Cheyney, deceased, and will be succeeded by **W. L. Colburn**.

E. T. Reynolds, who has been appointed assistant general freight agent of the Pere Marquette, with headquarters at Detroit, Mich., was born in Canada and entered railway service as a telegraph operator and relief agent on the Grand Trunk. He was transferred to the local freight office at Buffalo, N. Y., in 1901, and remained there until 1905 when he was appointed chief clerk to the general agent of the Pere Marquette at Buffalo. He was promoted to traveling freight agent, with headquarters at New York, in 1906, and two years later was promoted to eastbound agent, with the same headquarters. Mr. Reynolds was promoted to commercial agent, with headquarters at Pittsburgh, Pa., in 1914.



E. T. Reynolds

During federal control he was assigned to the treasury departments of the Pere Marquette and the Grand Trunk, but left railway service in 1919 to become traffic manager of a motor car company. Mr. Reynolds returned to the Pere Marquette as general agent in March, 1922, and held that position until his recent promotion to assistant general freight agent.

C. E. Norris has been appointed general agent of the Chicago & Alton, with headquarters at Kansas City, Mo.; **Barth Riedy** has been appointed general agent, with headquarters at Indianapolis, Ind., and **F. A. Olson** has been appointed traffic agent, with headquarters at Peoria, Ill.

A. E. Buchanan, division passenger agent of the Pennsylvania, with headquarters at Philadelphia, Pa., has been appointed assistant general passenger agent, with the same headquarters, succeeding **Richard J. DeLong**, who has retired under the pension regulations of the company after 41 years of service. **D. M. Becker**, hitherto district passenger representative at Philadelphia, has been appointed division passenger agent, with the same headquarters, succeeding Mr. Buchanan.

A. C. Burgess, commercial agent of the Belt Railway Company of Chicago, with headquarters at Minneapolis, Minn., has been promoted to general agent, with the same headquarters. The position of commercial agent has been abolished.

James J. McManus, assistant claim agent of the Northern Pacific, with headquarters at Seattle, Wash., has been promoted to general freight claim agent, to succeed John F. Horrigan, deceased, and will be succeeded by **Thomas A. Faughman**, assistant freight claim agent, with headquarters at St. Paul, Minn., who in turn will be succeeded by **Walter F. Smyth**, chief clerk.

W. D. Skinner, traffic manager of the Spokane, Portland & Seattle, with headquarters at Portland, Ore., has resigned and the position of traffic manager has been abolished. **R. W. Pickard**, assistant general freight agent, with headquarters at Portland, Ore., has been promoted to general freight agent, with the same headquarters. **R. H. Crozier**, assistant general passenger agent, with headquarters at Portland, Ore., has been promoted to general passenger agent, with the same headquarters. **J. M. Ballingall**, general agent, with headquarters at Astoria, Ore., has been promoted to the newly created position of assistant to the general freight agent, with the same headquarters, and will be succeeded by **J. T. Hardy**, traveling freight agent. **J. C. Moore**, city freight agent at Portland, Ore., has been promoted to the new position of general agent, freight department, with the same headquarters. **H. W. Shields**, traveling freight agent of the Oregon Electric Railway has been appointed contracting freight agent, with headquarters at Portland, Ore. **J. C. Abbett**, city freight agent at Portland, Ore., has been promoted to advertising agent, with the same headquarters.

Engineering, Maintenance of Way and Signaling

M. J. McDonough has been appointed division engineer of the Pennsylvania division of the Delaware & Hudson, with headquarters at Carbondale, Pa., succeeding H. S. Rogers, resigned.

W. L. Trout, service engineer of the Galena Signal Oil Company, has been appointed superintendent of motive power of the Uintah, in charge of the locomotive and car department, with headquarters at Atchee, Colo. Mr. Trout began his railroad career as a machinist in 1898 with the Pennsylvania at its Altoona shops and was afterwards roundhouse foreman at various points on that system until 1912 when he entered the employ of the Western Maryland as general foreman at Cumberland, Md. In 1915 he was appointed general foreman and master mechanic of the Baltimore & Ohio, with headquarters at Philadelphia, Pa., and for a part of 1916 was inspector for the Baldwin Locomotive Works at Eddystone, Pa. From 1916 to 1919 he was motive power inspector and general foreman of the car department of the Long Island at Morris Park, N. Y. Since 1919 he has been service engineer of the Galena Signal Oil Company.

Purchasing and Stores

J. H. Lauderdale has been appointed general purchasing agent of the International-Great Northern, with headquarters at Houston, Tex., to succeed C. B. Porter, resigned.

J. P. Kavanagh, general storekeeper of the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has had his jurisdiction extended over the entire system of the Chesapeake & Ohio, with the same headquarters. **W. L. Monning**, assistant to the superintendent of stores, with headquarters at Huntington, has been appointed assistant to the general storekeeper, with the same headquarters, the position of assistant to the superintendent of stores having been abolished. **John Thomson** has been appointed chief stores accountant, with headquarters at Huntington. **E. R. Brinton**, general storekeeper at Covington, Ky., has been appointed assistant general storekeeper, with the same headquarters and **A. H. Young, Jr.**, general storekeeper at Clifton Forge, Va., has been appointed assistant general storekeeper, with the same headquarters, the positions of general storekeepers of the Western and Eastern general division having been abolished.